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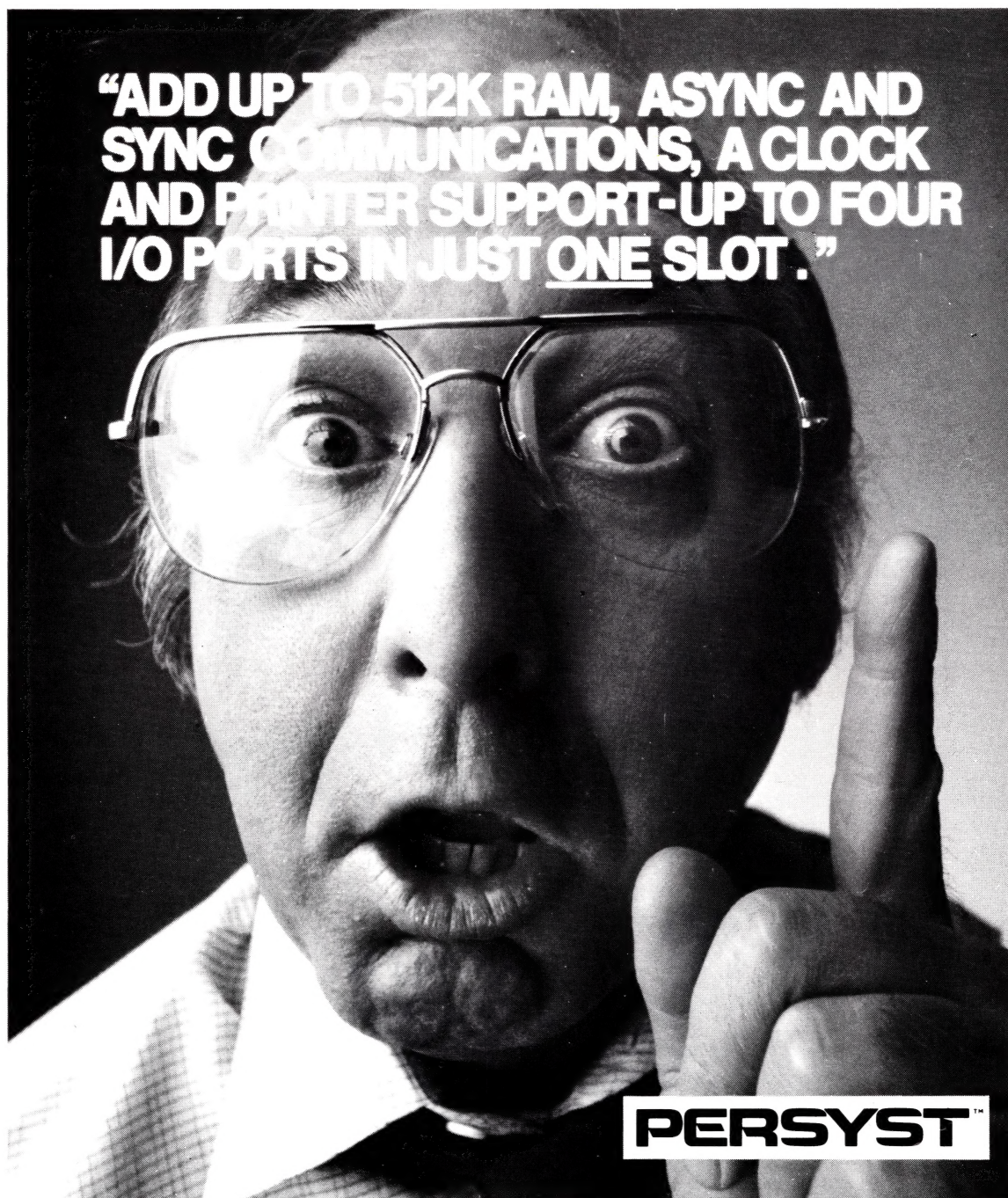
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# THE AFFORDABLE HIGH PERFORMANCE PLOTTERS - FROM ROLAND.

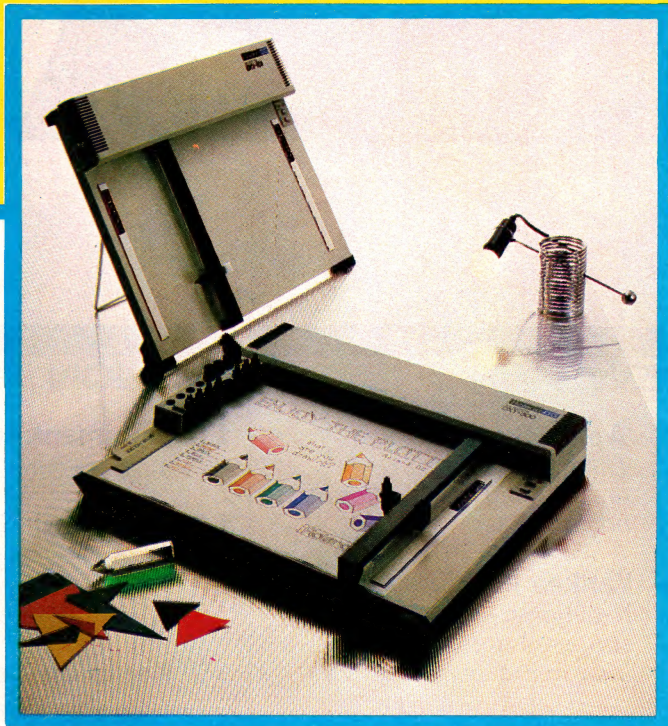
If you've travelled overseas, then you would have heard about Roland Corporation's high-performance, low-cost, multi-pen, color plotters. Now, you won't have to travel because they are available here from Roland dealers in all States.

Roland's high performance 8 pen plotter also comes with a single pen variant (DXY101). These flatbed X-Y plotters are the most compact units of their kind and come in a portable carry case.

They have an effective plotting range of 360mm x 260mm (A3) and can operate on an incline up to 60°, a practical application in the work situation.

Maximum operating speed is 180mm/sec, very fast for this type of plotter. Optional speed settings allow adjustment for different types of pen and paper. Additional pen holders are supplied allowing use of a wide variety of pens with the DXY800.

Roland X-Y plotters feature a wide variety of command applications; vector commands,



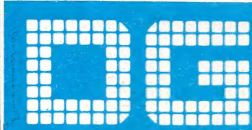
character commands, graphic commands and pen exchange commands.

Both RS-232C Serial and Centronics parallel interfaces come built-in as standard features, making Roland X-Y plotters compatible with virtually every model on the market. And we have support graphics software.

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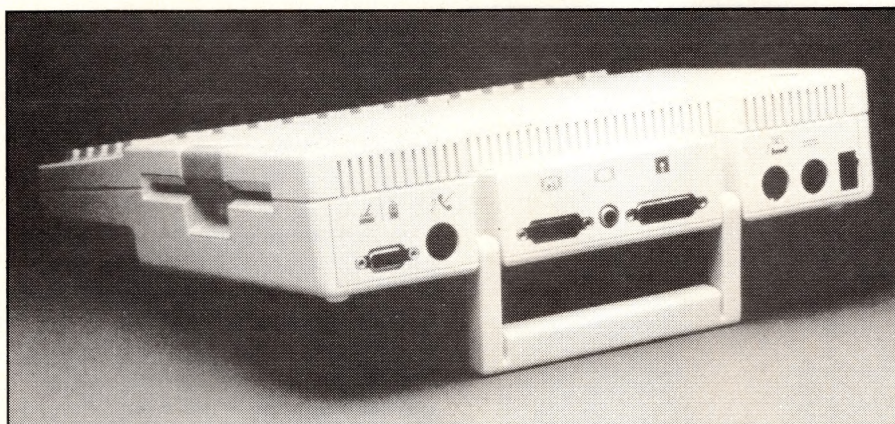
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## Apple Delivers Another Surprise

*The IIc is a radical repackaging of the Apple II and the first complete product released for the home computer market.*

SEVERAL years of speculation about a redesign of the Apple II computer came to an end on April 25 when Apple announced the Apple IIc. Most of the speculation had suggested that Apple would release a low-end slotless Apple II, a portable and a 16-bit system. Apple confounded most of the speculation with the release of the IIc, a transportable home computer bundled into a sophisticated consumer package.

The system specifications include a 65C02 processor, 128K-bytes of RAM, 16K-bytes of ROM, built-in 143K-byte disk drive and Apple IIe-compatible keyboard. The system has no internal expansion capacity, but provides connectors for joystick or mouse, modem, printer, disk drive, video monitor, flat-screen display and RF modulator for use with a television set. The power supply is external to the computer.

The case is a complete redesign of the IIe and is called the Snow White design, intended to be the design for the Apple II/III family. It has a Japanese feel, is made of white moulded plastic, measures 30cm x 29cm x 8cm and weighs 3.4kg. A handle at the back of the unit is used to carry the system and to tilt the keyboard to a useful angle. The unit looks good, feels good and will generate considerable comment among existing Apple users.

Features include a built-in mouse controller, switch-selectable 40/80-column mode and switch selectable keyboard configuration. In the US, this will switch the keyboard from QWERTY to Dvorak layout. In Australia, it will switch between American and international character sets.

The loudspeaker sound level can be adjusted with a volume control knob, and an earphone plug is provided. The little-used 560 ultra high-resolution graphics mode is included as standard.

The disk drive is built into the unit at the back right-hand side and is very quiet. A new range of peripherals will be released for the IIc as peripherals for the IIe cannot be used. Towards the end of this year, an 80 x 24 line LCD will be released for the IIc with a battery pack so that the system can be used as a portable computer. The LCD will not support graphics.

System software includes ProDOS and a four-disk set of Apple Presents Apple tutorials covering an introduction to the computer and Basic and Logo programming.

The IIc is said to be 95 per cent compatible with software for the IIe. The internal differences are the 65C02 processor chip which has a slightly expanded 6502 instruction set, a mousetext character-generator ROM and a rewritten monitor

ROM. The mousetext character-generator ROM replaces one of the inverse uppercase character sets with characters that can be used to build text, screen-based mouse-driven pulldown menus and windows. Apple is encouraging all software developers to use these facilities. The main entry points into the monitor ROM have been preserved but the rest of the code has been substantially modified.

A 9in monitor will be available for the IIc, and Apple's marketing manager, David Roman, says the quality of color produced using the Pal modulator and a color television set is high, and an improvement on the quality possible with the IIe.

Apple has priced the IIc at \$1775 and will distribute the machine through its dealers and in department stores.

Apple expects to sell 400,000 machines world-wide in the first year of release, with 65 per cent to the home, 20 per cent to education and 15 per cent to small business. The IIc will be available from Apple dealers in Australia in May.

The IIe system has been repositioned to the school education market, hobbyist and small business markets. A 20 per cent reduction in the price of the IIe is expected, together with promotion of the IIe as a diskless network station using Apple Bus.

Apple has split itself into two divisions, one to handle the 32 Supermicro family and the other the Snow Whites. The Apple II/III division will become more consumer orientated, as Apple shows what can be done for the long-suffering microcomputer consumer, with the delivery of a superbly packaged, supported and designed product.



The IIc 80 x 24 line flat panel display.



# Yankee Group predicts 100% Growth

**The Yankee Group says traditional computer suppliers will increase their micro market share in the next five years.**

THERE are very few microcomputer industry analysts in Australia. Most of the industry comment in Australia, particularly in the popular press, is based on derivative US sources, personal experience, popular myth and rumor.

Every year, Australia's leading analysis companies, IDC and the Yankee Group, conduct a three-day briefing session on the state of the microcomputer industry. The companies have different styles, with the considered conservative analysis of IDC contrasted with the issue-based approach of the Yankee Group.

Last month, the Yankee Group conducted its briefing session focusing on desktop micros in the office and "Apple vs. IBM". The briefing was led by Dale Kutnick and Chris Christiansen from the US and local researcher Graeme Phillipson with publicist Gareth Powell for light relief.

Kutnick presented an overview of the industry, stating that desktop computer prices would continue to drop towards \$US1500 until 1986, when they would start to stabilise. Portable prices would drop through to about \$US1000. He expected installed desktop computers to explode from an installed base of 4 million units last year to 27 million in 1988, creating a bottom-up office automation process, with desktop computers eliminating word processors from the office.

He expected IBM to release a number of products later this year including an 80286-based system that would be delivered as a multi-user system, supermicro or network file server. IBM would bring its VM operating system down into its microcomputer products and release a flat-screen briefcase portable this year.

Apple would replace the Apple III with a 16-bit version of the Apple II, he said, and would push forward quickly to the release of the 512K-byte version of Macintosh, as many

software developers were holding off development until it was available.

The distribution of hardware was undergoing a major shift, he said, with the role of value-added distributors becoming much stronger at the expense of dealer retailers. IBM was encouraging this process.

While not expecting great changes in the technology used in desktop systems, he expected advanced electronic telephone and desktop computers to merge into a single unit. The printer market would grow at the same rate as the desktop system market with increas-

ed emphasis on shared printers and laser technology, which should be available at the end of the year, he said.

Chris Christiansen talked about the software market, saying it would grow from \$US1.7 billion last year to \$US10.7 billion by 1988. Most applications would continue to be financial management, followed by accounting and information management. He expressed reservations about integrated software, saying that "integrated" is to the software industry what "all natural" is to the food industry.

By 1988, 80 per cent of desktops would be communicating systems compared to 10 per cent today and the micro-mainframe software industry would be worth \$US3 billion, he said.

## DESKTOP COMPUTER MARKET NUMBERS BY ALL VENDORS

(1983 - 1988)

### TOTAL WORLDWIDE

Year	Unit Shipments*	Installed Base*	Retirements*	Average Price	Revenues (in thousands)
1983	3772	6846	342	\$3,375	\$11,946,800
1984	6498	12061	1283	\$3,000	\$17,864,400
1985	9614	18793	2881	\$2,550	\$22,629,200
1986	13830	26471	6152	\$2,100	\$27,114,000
1987	19644	37539	8576	\$1,900	\$35,984,800
1988	26821	52386	11974	\$1,750	\$46,022,000
CAGR	48.0%	50.2%	103.7%	-12.3%	31.0%

## Actual and Projected Australian Microcomputer Shipments (Business Systems)

BRAND	To 1982	1982	1983	1984	1985
Apple	4,500	5,000	6,000	8,000	10,000
IBM	—	—	5,000	10,000	20,000
Tandy	2,000	2,500	3,500	5,000	7,000
Sirius	—	1,500	2,500	1,000	—
Commodore	2,000	1,000	2,000	3,000	4,000
NEC	—	500	1,500	2,500	4,000
DEC	—	—	1,500	4,000	6,000
Wang	—	—	500	2,000	4,000
Other	1,000	3,500	7,500	14,000	21,000
TOTAL	9,500	14,000	30,000	49,500	76,000
CUM. TOTAL	9,500	23,500	53,500	113,000	189,000

Source: Yankee Group.



The big growth areas in micro-mainframe software should be distributed data entry, electronic mail and enquiry-response. He said IBM was using the "Trojan Horse" strategy of intoxicating end-users with limited processing power of the IBM PC creating explosive demand for host system resources in the future.

The minicomputer would become a cluster controller and file server for desktop systems and the challenge was to develop sophisticated, transparent networking with distributed databases, he said.

Powell was the first of the Australian speakers, delivering another chapter in his story of "My life with computers". It was explained later that the Yankee Group likes to include a presentation by a computer user in its briefing sessions.

Phillipson, the Yankee Group's Australian researcher, presented an overview of the development of the Australian desktop market. While a little soft, philosophical and Apple-eyed, his presentation was a reminder of the important events of the past three years.

In presenting his figures for the installed base of desktop systems in Australia, he drew attention to the sales figures for Apple computers, pointing out that, despite the recent controversy over the number of IBM PCs in Australia, the number of Apple computers in Australia is much more contentious, with wide variations in estimates. He offered few insights to the direction that the local market might take except to suggest that IBM would consolidate its position.

## VICTORIA TAKES A SOFT APPROACH

THE Victorian Education Department's tender for approved suppliers of computer equipment to schools was let at the beginning of March.

The Victorian tender was different from those in other States, as it requested a solution to a statement of needs, with the package including software and compliance with the State government offsets policy. The department adopted a three-

level approach to the use of computers in schools derived from a discussion document circulated last year.

Level 1 involved a minimal configuration capable of supporting Logo and word processing with the possibility of networking. Level 2 covered a broad range of applications, supported by a 64K-byte disk-based computer and Level 3 specifies a networked system to support computer studies and school administration. The Level 3 approach reflects the development of computer education in Victorian technical schools. The main criterion for Level 1 and 2 machines was the ability to support a full implementation of Logo.

The approved systems were tendered as packages, with schools buying a bundle of hardware and software as a complete system rather than the "minimal hardware with a range of optional peripherals" approach adopted in other States. This has enabled the Victorian department to negotiate with suppliers on the issues of software and support. An important aspect of the tender is that all service will be carried out by the suppliers at favorable rates negotiated by the department.

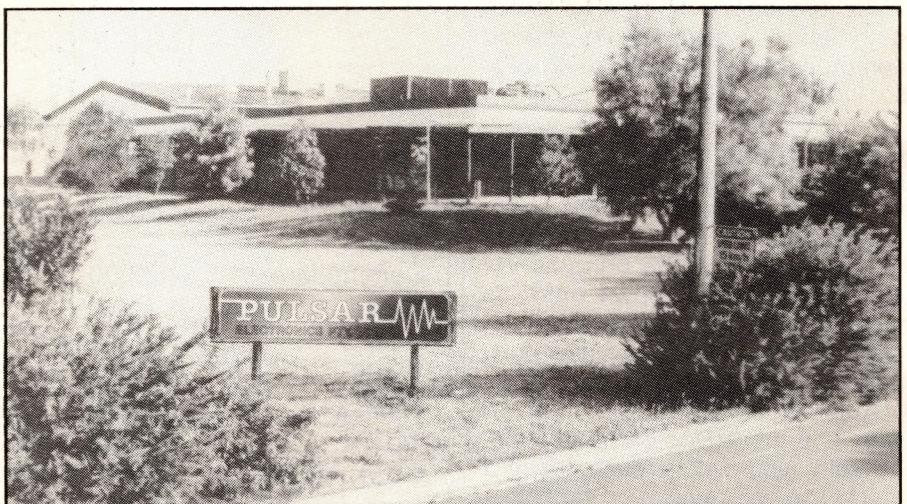
The Level 1 package is the Commodore 64 with color screen, disk drive, Logo and word processing software, price at \$1058. The Level 2 package is the Apple IIe with green screen, disk drive, 80-col-

card, Logo, and word processing software priced at \$1990. The Level 3 system is the Pulsar 6000 manufactured in Victoria by Pulsar Electronics. The Pulsar 6000 is a shared-bus, multi-user system built on the Z80A-based Little Big Board with additional Z80A STD bus cards for each user.

The system runs CP/M and the CP/M-compatible TurboDOS operating system. A single-user system includes a 1.3M-byte floppy disk and Wyse WY1000 terminals for \$2710 and optional 8.2M-byte hard disk for \$2320. A four-user system capable of expansion to eight users and including a 12M-byte hard disk is priced at \$11,270. Software includes MBasic, UCSD Pascal, WordStar, dBase II and Multiplan priced separately.

The approved supplier list has created much comment in the Melbourne press, with sources close to Barson Computers reportedly being very disappointed the BBC was not chosen. The BBC computer does not support a full implementation of Logo.

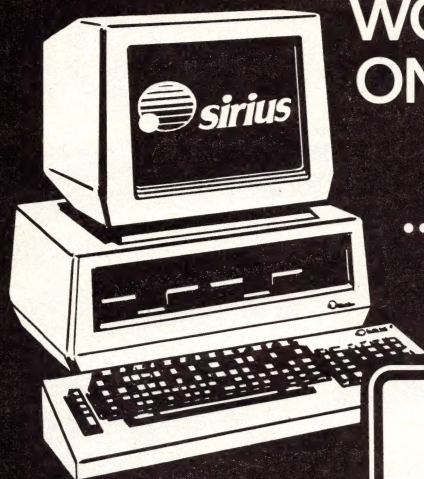
While the level approach and the approved-supplier list is a compromise between the various factions and interest groups that comprise Victorian computer education, the innovative execution of the tender by the department is sure to create precedents that will be followed by other States when they consider their next tenders for computer equipment.



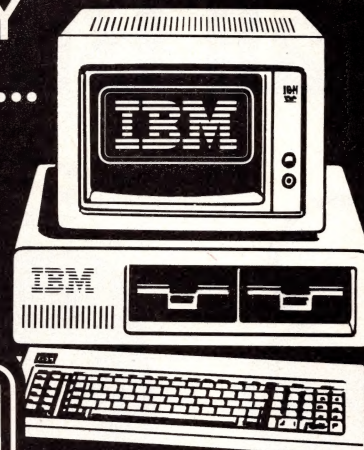
The Pulsar Electronics factory of Tullamarine, Victoria.



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The special user interface called 'B-Shell' allows the use of industry standard software, while being much 'friendlier' than most CP/M systems. 'ICONS' are used to select commonly used programs. **INIT** and **TRANSFER** programs simplify 'housekeeping' function. A comprehensive **HELP** system is also supplied.

The CP/M 2.2 operating system fully

utilises the capabilities of the 128K SBC. Automatic disk caching increases program speed by 50%. 'M-drive' software allows 65K of RAM to be used as a fast disk. **SETDRIVE** allows other disk formats such as **KAYPRO**, **IBM**, **OSBORNE** to be read.

In its review of the leading Australian computer manufacturers in October 1983, Australian Micro Magazine claims:

“**microbee** is the biggest success story of Australian computer design and manufacture, and the only Australian attempt to get into the demanding consumer market.

... it is listed on IDC's market predictions for this year.”

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**Manuals Supplied:**— **microbee** disk manual (describes use of CP/M utilities and system specification); **Microworld BASIC**; **Microsoft BASIC**; **Microsoft Multipan**; **Wordstar Reference and Training Manual**; **Wordbee User Guide**.





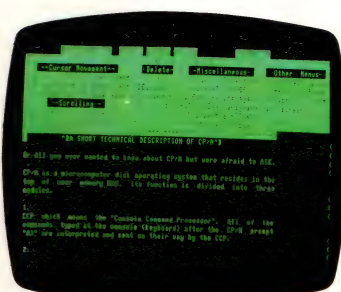
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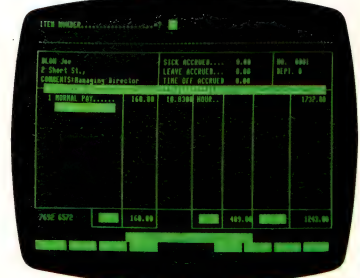
**microbee 128K Small Business Computer-Z80A** operating at 3.375 Mhz, 128K bytes of dynamic RAM, 2K bytes screen and graphics RAM, 8K bytes of system firmware controlled with specially designed memory management unit. High resolution 512 x 256 PCG graphics, programmable parallel and serial ports.

Operating system	CP/M 2.2 with M/drive,
User interface	Disk caching
Wordprocessing	BShell
Spreadsheet	WORDSTAR 3.3
Accounting, Pay Roll etc.	MULTIPLAN 1.05
BASIC	SYBIZ Business Package
PCG high res. graphics	MICROSOFT, MICROWORLD
Communications	512 by 256 pixels
Terminal emulation	TELCOM 2
Serial Port RS232	ADM 3A/TELEVIDEO
Parallel Printer Port	INCLUDED
Internal loudspeaker	INCLUDED
Disk Drive Capacity	2 by 400 bytes (FORMATTED)
MONITOR	AMBER/INCLUDED

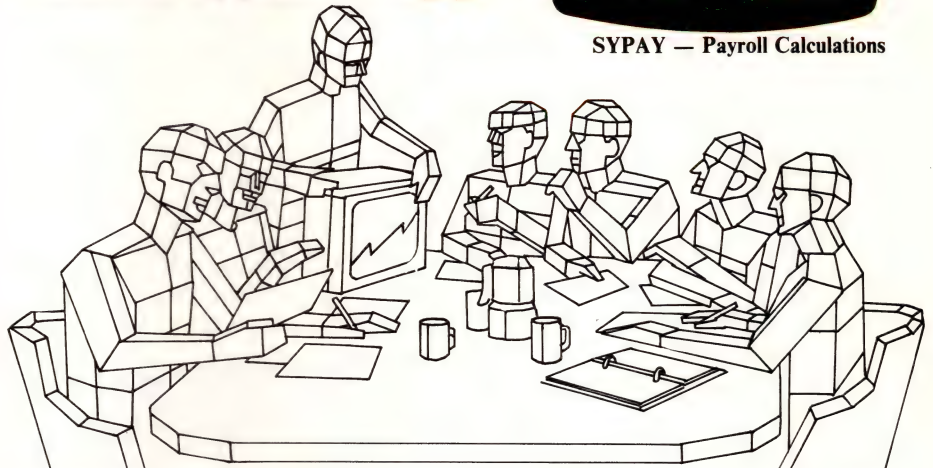
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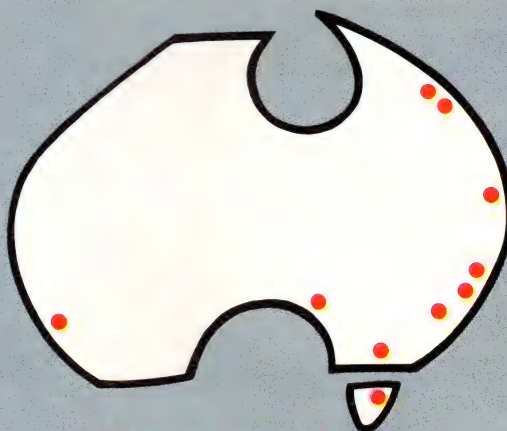
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## SCHOOLS PROGRAM

IBM has entered the Australian schools computer market with the announcement of a \$2.5 million computer literacy program. Apart from a small number of individual grants, the only presence IBM has had in schools computing has been as an approved supplier to the NSW education department.

IBM will contribute 221 IBM PCs and necessary software to inservice selected teacher education institutions and secondary schools in New South Wales, Queensland and South Australia. A teacher education institution in each State will receive 15 IBM PCs and training for institution staff by the Educational Testing Service of Princeton, New Jersey. Training will begin in May.

Eleven secondary schools, selected by State education bodies, will be supplied with 16 IBM PCs each and appropriate software. The teachers at the schools will be inserviced and supported by the lecturers from the teacher training institutions. Training of secondary school teachers and delivery of the computers is expected in late 1984 and early 1985.

The opening of the IBM manufacturing plant at Wangaratta, in July, is expected to put IBM in a competitive position when the various 1985 tenders for approved computer equipment to schools are announced.

## KAYPRO FUTURES

PRESIDENT Computers has announced significant price reductions on its range of Kaypro and Columbia computers as well as announcing several new products from Kaypro due this year. This year the company will be promoting the importance of independent computer dealers as computer distributors tie up the Australian dealer base. A series of television commercials may be used later in the year.

The Kaypro II has been priced at \$2160, Kaypro 4 at \$2838 and the 10M-byte hard disk Kaypro 10 at \$4798 excluding tax.

The range of Columbia computers is now priced at \$3940 for the Columbia UP portable, \$4600 for the Columbia 1600-1 and \$6800 for the Columbia 1600-4 excluding tax.

President Computers managing director Tom Cooper, who had just returned from visiting Kaypro in the US, said that Kaypro intended to try for the number three position in the microcomputer industry behind IBM and Apple. Kaypro intends to release several new machines this year, including the Kaypro Robi, a home and educational computer priced under \$2000 and a flat screen portable computer, he said.

The portable computer is reported to be manufactured by Mitsui with a 16-bit processor, 256K-bytes RAM

and a 16 x 80 LCD display.

President Computers also announced the release of the Web, a network for Kaypro computers that can be extended to allow IBM PCs and compatibles on the same network. The cost is expected to be \$500 per station and to require the installation of a board in each system attached to the network.

## PACESETTING PRINTERS

PACESETTER Peripherals has announced its appointment as Australian distributor for Silver Reed printers.

Pacesetter, a division of VSI Electronics (Australia) Pty Ltd, suppliers of electronic components, will initially market a range of three daisywheel printers for personal computers. A spokesman for Pacesetter said the company had been established to cater mainly for the OEM market. It had offices in all mainland States and could boast 24-hour delivery from receipt of order.

The printers are manufactured in Japan by Silver Seiko Ltd, which has recently begun marketing a range of typewriters in Australia through its own subsidiary. A spokesman for Silver Reed Australia said Pacesetter had been chosen to distribute the printer range because the OEM market demanded different expertise from the office products market.

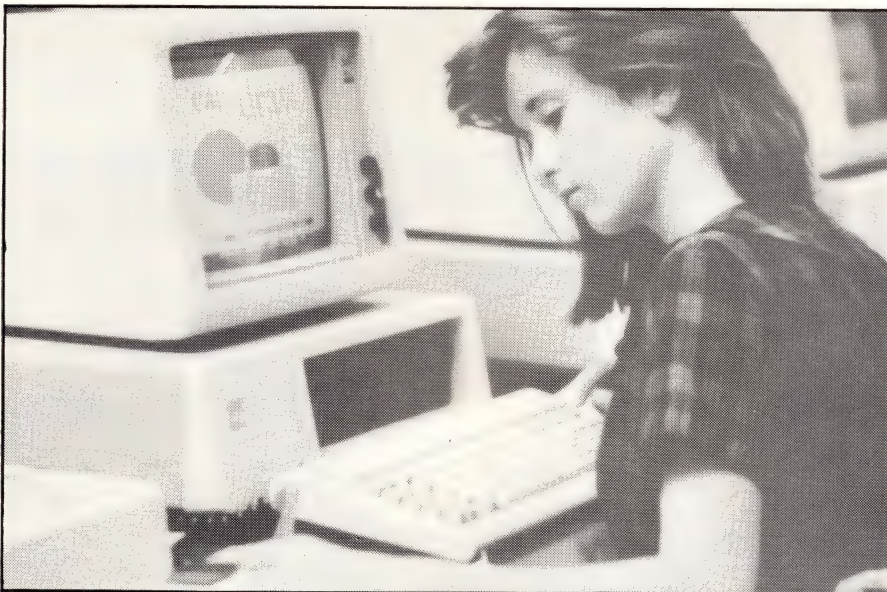
The Silver Reed range comprises the EXO 500, 550 and 770 models. All are claimed to be compatible with most word processing packages and to interface to micros through either a Centronics parallel or RS232C serial port. The 500 handles paper up to 10in wide, the others up to 13in wide.

Prices start at \$A734 for the 14cps, EXP 500 excluding tax.

## LASER PRINTING

CSIRO's Division of Computing Research, in conjunction with Microsystems Pty Ltd, has announced the opening of the first "Electronic Demand Laser Beam Printing Service" in the ACT.

The service, which began operations early in January, brings together



Computer literacy, IBM style, is coming to Australian schools.



er the versatility and power of a 7200 impression per hour Xerox 9700 Laser Beam Printer, interfaced to a Metaform Graphics workstation, an Autokon Mark II Graphics Scanner, Xerox 860 word processor, and a text, font and forms software composition package.

The process takes place at extraordinary speeds enabling the 9700 to print up to 18,000 'lines' of information per minute, the equivalent of two A4 images per second, or 7200 impressions per hour. A unique feature of the machine is that it can print both sides of an A4 sheet in a single pass, and collate the pages into sets ready for binding.

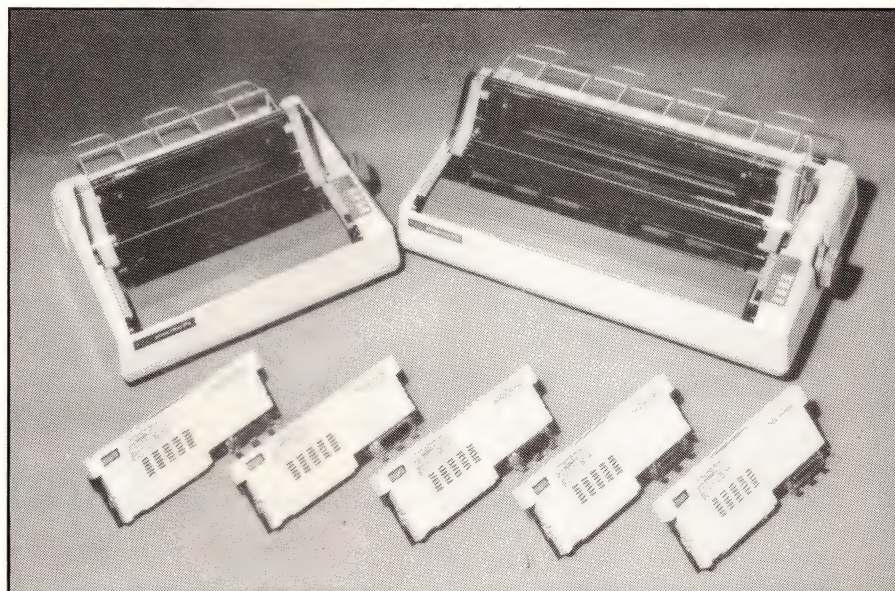
## MAC CLASSROOM

AUSTRALIAN tertiary institutions have been considering Apple Computer's offer of substantial discounts for volume purchases of Macintosh and Lisa computers. While administrations have been cautious about the offer, some computer science departments have been enthusiastic about the potential of Macintosh as a first-year environment for learning programming.

Wollongong University has installed 30 Macintosh computers for use in a first-year computing laboratory. According to department head Professor Juris Reinfelds, the laboratory is a continuation of the department's policy that extensive hands-on experience using modern equipment is the only satisfactory method of learning the experimental science of computing.

"A new program of regular first-year computing science laboratory classes began with the workstations this semester," said Professor Reinfelds. "We are utilising the Macintosh because it is especially easy to use for casual and novice users. This allows the students to concentrate on the concepts and difficulties of programming and expressing programs in the Pascal language."

The department intends to develop software for Macintosh and has been chosen as a Beta test site for the Macintosh Pascal compiler/interpreter.



Necisa's Pinwriter 'near letter-quality' dot matrix printers.

## HOT OSBORNES

OSBORNE buyers beware... There are seven stolen Osborne Executives floating around Sydney. The Osborne Sales Centre says warranty will not apply to these machines; they have not been converted to 240V power and have not been burnt in. The serial numbers of the hot boxes are: EDCA-024521, EDCA-025421, EDCA-024526, EDCA-025469, EDCA-025474, EDCA-025470, EDCA-024590.

Contact: Osborne Sales Centre (Aust), 93 York St, Sydney, 2000. Tel: (02) 290 3344 if you have any information.

## FORCE 4 ARRIVES

A NEW Australian designed micro-computer, the Force 4, developed by Commercial Dynamics Pty Ltd, will be marketed through a newly established company, Computique.

The Force 4 is a multi-user Z80A based system with a Z80A master CPU and Z80A satellite CPUs using the TEEE 696 bus. The Force 4 also features a Syquest disk drive with a removable 5M-byte disk cartridge.

The Force 4 will be supplied with software developed by Commercial Dynamics to tailor it for several vertical markets including newsagents, real estate, the liquor trade and writers.

## NECISA SALES

NECISA has released sales revenue figures in excess of \$18 million for the financial year 1.4.83 to 31.3.84. Revenue is claimed to be balanced across its product range with sales of more than 100 Astra minicomputers, 2374 Spinwriter letter-quality printers, more than 2000 Advanced Personal Computers and over 1800 units of the PC8201 portable in the six months it has been on sale.

The company has set a target of more than 4000 APC sales in the next financial year. Necisa also intends to continue its sponsorship of sport on television with support for live football broadcasts in most States.

The integrated application program Context MBA has been announced for the APC. This \$895 package features integrated spreadsheet, word processing, data management, telecommunications and graphing in color.

Necisa has also announced the Pinwriter range of dot matrix printers, offering high-speed correspondence quality print using an 18-pin print head. The printers will print at speeds to 180cps with the P2 (10 inch) selling for \$995 and the P3 (16 inch) selling for \$1250 excluding tax. The printers feature an interchangeable interface module for compatibility with most computer systems.



# GrafTalk

**GrafTalk** is a complete GRAPHICS subsystem. It comprises a full-screen spreadsheet-like editor, a dual screen command editor and simple command generation of pie charts, bar charts and X-Y plots. Graftalk is both fully menu-driven and fully programmable. It is a standard in the micro-computer world which can accept data from all popular spread-sheets and database system reports.

If you have any of the following equipment, **GrafTalk** can be installed:

## Computers

IBM PC  
DEC Rainbow  
Any Z80/8080 compatible  
North Star Advantage  
Televideo TS803

## Screens

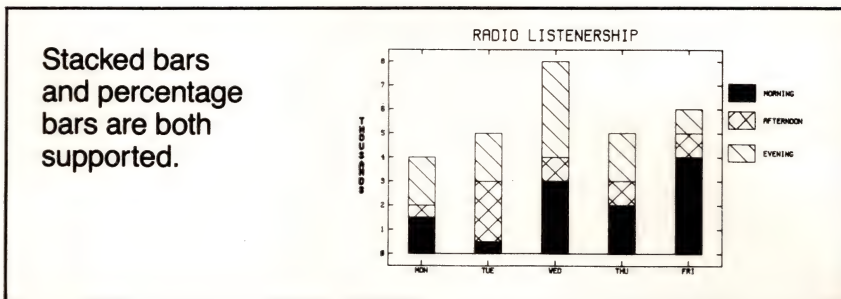
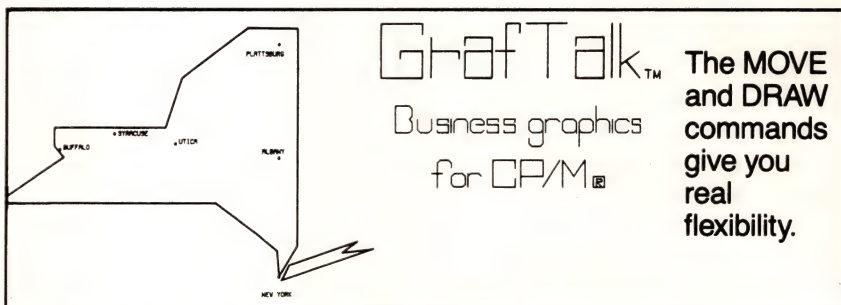
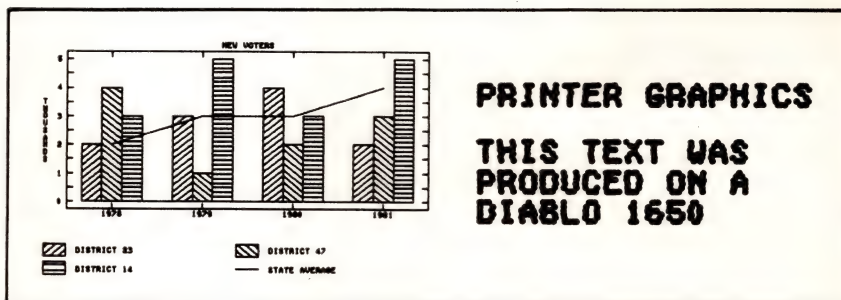
ADM3A or ADM3+ or ADM5 with  
RG512 retrofit  
Televideo 912, 9020 with Datatype retrofit  
(Autograph 120)  
Televideo 910, 950 with Datatype retrofit  
(Autograph 150)  
ID-100 VB  
VT100 with Digital Engineering Retrofit  
(DE VT640)  
TAB 132/1S-G with TB600 Board  
Televideo Terminal with Selanar SG900 board

## Plotters

Calcomp 84, Calcomp 81, Goerz 284,  
Goerz 281, IBM XY/750  
Hewlett-Packard 7220, 7225, 7221, 7470  
Houston Instruments DMP-3, -4, -6, -7, -29  
Panasonic VP-6801P  
Strobe Model 100  
Tektronics 4662  
Watanabe 4675, 4636  
Mannesman Tally PIXY3 plotter  
AMDEK Amplot II plotter

## Printers

Diablo 1640, 1650, 630 (as direct plotting device)  
NEC Spinwriter 5510, 5520 (as direct device)  
Anadex 9501 (as dump device)  
Diablo 1640, 1650, 630  
NEC Spinwriter 5510, 5520  
Paper Tiger IDS-460  
Epson MX80, MX100, FX100  
Okidata 82A, 83A, 84 (also known as  
Microline, ICL . . .)  
Okidata 84  
Okidata 92, 93  
C. Itoh Prowriters, 8510 and 1550  
DEC LA50 printer



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## SPERRY MAPPER

SPERRY has introduced what it calls the industry's first fourth-generation-language microcomputers for either standalone use or mainframe connection.

Sperry's Mapper 5 and Mapper 6 microprocessors, the first of a new line of desktop microcomputers, bring the company's Mapper mainframe application development software down to the chip level.

The systems' basic configuration is said to feature an 8MHz Motorola 68000 microprocessor with a discrete virtual memory management unit for virtual address translation. Up to 30 processes are supported, each with a maximum private virtual address space of 4M-bytes.

## EXPORT REVIEW

PRESIDENT Reagan has given the US Department of Defence the power to review exports of computers, test equipment and microchip manufacturing parts to 12 non-communist countries widely suspected of being shipment points to the Eastern bloc.

The decision to give the review power to Defence has prompted concern from American computer manufacturers of the products affected, who fear that delays in obtaining export approval will mean lost sales to foreign competitors. The American Electronics Association said it was "disappointed" by the action.

The US Department of Commerce declined to reveal the 12 countries singled out for the licence review, but officials confirmed the countries include Switzerland, Austria, Sweden, Finland, Liechtenstein, South Africa, India, Hong Kong and Singapore.

## VICTOR SALE

VICTOR Technologies Inc has said it intends to sell all the assets of its computer business.

In a letter responding to Applied Computer Technologies' (ACT) revised proposal to acquire the worldwide manufacturing and distribution rights to Victor's business, Victor's

board of directors "declared its intention to sell substantially all of the assets of its computer business".

ACT, a distributor of Victor products and the company's single largest customer, made its first proposal shortly after Victor filed for bankruptcy protection in February. ACT officials refused to comment on what revisions it had made in the second proposal submitted last month.

Victor indicated it is considering submitting ACT's proposal for approval by the interested parties. Victor also told ACT its offer has the full support of the creditors committee, according to an ACT spokesperson.

The proposal would secure for ACT the rights to manufacture Victor's computer products anywhere in the world. Also, it would give ACT distribution rights anywhere in the world except in the Americas.

## A-T FRAMEWORK

ASHTON-Tate has unveiled a software package integrating spreadsheet, word processing, graphics and database capabilities with an "outline" or "electronic table-of-contents" utility for organising manuscripts made up of text, graphs and columnar charts.

The package, called Framework for its use of "frames", or windows, is expected to compete against Lotus Development Corp's recently announced Symphony product. Framework, which requires 256K-bytes of RAM and two disk drives, will sell for \$US695, the same price as Symphony, and is expected to be available on the same date, July 2. Ashton-Tate's president David Cole said Framework will initially be available on the IBM PC and compatible computers, but may be adapted for other hardware manufacturers.

## UNIX SUPERMICRO

AT&T has made its long-awaited entry into the computer industry with the release of a range of Unix-based mini- and microcomputers.

The microcomputer system is the AT&T 3B2, a desktop multi-user supermicro bringing a full 32-bit architecture, 256K-byte memory and the Unix operating system to the desktop environment. It can handle up to 18 users, or can be configured as a powerful single-user system.

Two networking products were also released: 3B Net, a high-speed network that ties AT&T 3B computers together and interfaces to the Ethernet standard; and the AT&T PC Interface, connecting the 3B2/300 to IBM-compatible PCs providing full 32-bit Unix System V service. This networking allows PCs to share expensive computer peripherals, such as hard disk and printers.

## PCs TO TRIPLE

IBM says it expects this year to triple the volume of IBM PCs over what it produced in 1983. Speaking to the New York Society of Security Analysts at the IBM Entry Systems division in Boca Raton, Florida, IBM president John F. Akers described the PC as "perhaps the most visible product IBM has ever made".

IBM has reduced the price of its PC by as much as 30 per cent in Europe. While the new prices are more in line with US prices, the machines will not be sold in IBM Product Centres in Europe for less than they would be sold in the US.

## COMMODORE PC?

THE news that Intel has licensed Commodore to make 8088 chips has sparked speculation that Commodore may soon enter the PC-compatible market.

Further evidence of Commodore's intention to enter a new market is its recent technology-licensing agreement with Bytec-Comterm, the Canadian manufacturer of the PC-compatible Hyperion portable computer.

Bytec officials claim that Commodore is working on a PC compatible, but Commodore would not admit that the licensing agreement will lead to an IBM PC-compatible project.



## PAPERBACK PROCESS

ADAM Osborne, former head of now bankrupt Osborne Computers, expects to rewrite the rules of software sales with his inexpensive Paperback Software (from the firm by the same name) that is due for release in the US around July.

Osborne says he will take excellent but unnoticed products of small companies and homemade programs by whiz kids, package them with easily readable, bound documentation and distribute them on the shelves of bookstores and computer stores. Paperback Software's products will cover the gamut of programs — word processing, games, business software, he says.

The first dozen or so programs will be priced from \$25 to \$50. Few will cost more than \$100. Osborne envisions a Paperback Software catalogue of 75 to 100 products.

Paperback Software will write no programs itself, but will take charge of manufacturing, production, sales and distribution.

"The costs will be defrayed enough that we'll all make money," he claims. Funding will come from expense partnerships through an underwriter who deals directly with Paperback Software, as well as participants. Single software projects are too small for most venture capitalists, he says, but a half a dozen expense partnerships will foot the bill. Osborne says he has guarantees from three investors, but declined to name them until the ink dries on the contracts.

## SYSTEM REVISION

MICROSOFT has abandoned plans to release version 2.5 of its MS-DOS operating system in favor of two new versions of the popular IBM PC-compatible product. Original equipment manufacturer (OEM) buyers in the US are expecting to receive their first copies of the next operating system this month, according to reliable sources.

While rumors of version 2.5 have circulated widely during the past three months, recent interviews have confirmed that Microsoft will

deliver versions of the operating system — to be called versions 3.0 and 4.0 — that will include multi-tasking and networking capabilities. The operating systems will also be compatible with Microsoft's Xenix operating system, a multi-user version of AT&T's Unix System III package.

Also under development is a networking product called MS-NET. Like the Windows window-manager product, however, the networking system will be sold separately from MS-DOS. Microsoft declined to comment on whether the networking package will work with the current release of the operating system, MS-DOS 2.1, but says it will work with the yet-to-surface 3.0 and 4.0.

## TOSHIBA EPROM

TOSHIBA Corp has developed and will market two new 256K-bit CMOS EPROMs (erasable programmable read only memory) of single-chip type.

The devices are claimed to have the world's lowest power consumption in EPROMs.

Samples of the new EPROMs will be available this month and volume production starts in June.

Worldwide demand for EPROMs is growing at a rate of 35 per cent a year, and it is expected that it reached about 150 million pieces last year — some 25 per cent of the world memory market.

## NEW OSBORNE PLAN

OSBORNE Computer Corp will go ahead with an amended re-organisation plan if its creditors vote to approve it.

The balloting is expected after the Federal Bankruptcy Court in San Francisco approves a financial disclosure statement.

An initial re-organisation plan was approved in September, after which a creditors' committee was formed to review and examine amendments and other proposals the firm filed with the court.

Some creditors objected to the Osborne financial disclosure state-

ment because it contained out-of-date information. Others wanted outside legal opinions on the plan, according to one creditor. At issue in the proceedings is whether or not Osborne can legally issue new stock to generate funds for the ailing company since that is a key element in the re-organisation plan.

## HOT CHIPS

SHORTAGES of Intel Corp micro-processor chips — particularly of the 80186 — are expected to ease following licences being granted to several companies.

Intel recently announced it had licensed Commodore International and IBM to manufacture the popular 8088 chip for their own use. The 8088 is at the heart of all IBM PCs and PC compatibles.

And Advanced Micro Devices (AMD) has announced it will begin second-sourcing Intel's more powerful 80186 chip, which has been plagued by severe shortages. AMD is already a second-source supplier of the 8088.

Analysts agree the new licensing arrangements will enable Intel to devote more of its resources not only to the 80186, but also to the 80286, another advanced Intel chip believed to be in prototype use by IBM. The 80286 is expected to be the central processor in IBM's next microcomputer product, a multi-user system.

Intel says it is able to meet only 25 per cent of the demand for the 80186.


## COLECO LOSS

COLECO Industries reported a loss of \$35 million for the fourth quarter of 1983. Production delays and slumping sales of the company's Adam home computer accounted for most of the loss.

A Coleco spokesperson said, however, that the company won't abandon the computer.

Company officials had predicted the company would be profitable by the end of 1983, but the spectacular fourth-quarter loss gave the company a net loss of \$7.4 million.





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# TAKE THE MONEY AND RUN

THE Schools Commission National Advisory Committee on Computers and Schools report is now available in its final form from the government printer.

While the report does present a long list of recommendations, which have extensive support in the computer education community, the lack of rationale, direction and context — the essential component of any national program — turns the report into a shopping list.

Of much more interest is the response from the Schools Commission and the endorsement by the Government of the report, released in a press release from the Minister for Education and Youth Affairs.

The Schools Commission was reportedly embarrassed by the Advisory Committee's report; not surprising, considering the report's enthusiasm for listing programs that could be funded, but its superficial treatment of rationale and lack of interest in wider educational community concerns.

This irritation is expressed very clearly in the Commission's response, when it delivers a succinct one-page statement that puts the computer-education program in its wider educational context. Apart from an outrageous statement about the neutrality of information technology, this page provides the coherent statement missing from the report.

The report's recommendations have been accepted by the Commission and the government with minor modifications to several points. The most important are that funds from this program cannot be used to establish a national computing network or any nationally-based information or investigation units, although these concepts are supported. The restriction of funds to support only three specified systems has also been rejected. The Com-

mission has released a confusing statement on this matter, using the same reason for its rejection as the report uses for its recommendation. Rather than the need to support more powerful machines with broader application, the rejection of this recommendation is more likely to have been based on influences brought to bear on the Government and marks the end of

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## **C**omputer education pioneers saw the potential of the computer as a tool to change the structure of education

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any aspirations that the tri-State consortium (Tasmania, South Australia and Western Australia) may have once had about influencing this policy.

The most disappointing aspect of the report has been the complete lack of comment and discussion about its contents. For a report so eagerly awaited, this silence is a mystery.

The group of people who have expressed some approval of the report have been the various State education departments. Several have emphasised that the report has little relevance to their State as they either do things differently, are more advanced than the other States, or the money on offer isn't enough to make any difference. This is certainly a petulant response from the departments who went to such lengths to ensure that the report reflected their interests.

The Department of Science and Technology's contribution to the report is the fifth paragraph of the rationale for a national computing program. This extraordinary para-

graph suggests that education can and should make a contribution to the national export effort by becoming a proving ground for the local computer industry.

Individual States have been very sympathetic to locally manufactured machines over the past few years, sometimes at significant cost to the education system, teachers and students. If any Australian company produces a useful machine it will be used, but the last thing that schools computer education needs at this time is to become involved in a commitment to a computer design.

Schools computing activities has been one of those rarest of educational phenomena: teacher/student driven innovation. The difficulties that professional educators and the State education bureaucracies have had in coming to terms with the phenomenon is indicative of the deep-seated problems faced by education in our society.

Computers in education is about the impact of technology on the system itself. As the Schools Commission says in its statement, computers in schools is about the total curriculum. It is the success of the State bureaucracies in passing off computer education as only about computers in classrooms that is reflected in the problems of the Advisory Committee's report.

The attitudes of the larger State education departments to these issues will continue unless strong community pressure forces them to change their approach. The Schools Commission must ensure that the committee established to manage the computers-in-schools program is not burdened with the bureaucratic concerns of the State departments.

If this intervention does not occur, teachers will find their patience and resilience sorely tested in the years to come.



# IT'S AUSTRALIA, MOVING FORWARD FROM 23RD POSITION ON THE BEND

AS PUBLIC awareness of the Australian computer industry grows, promising things are happening, indicating that many of the companies involved realise that being Australian is not sufficient excuse for ordinary performance. The consolidation of ACEMA (Australian Computer Equipment Manufacturers Association) as the recognised representative of most manufacturers has overcome some trivial personality issues which can disrupt the early development of such organisations.

Although the Federal government's endorsement of the Espie Committee recommendations leading to the establishment of licensed Management Investment Companies (MICs) has been a psychological shot in the arm for the local industry, many companies have complained that the time taken to actually get money flowing has caused a hiatus.

Informed sources suggest that the field of more than 40 well-presented applicants for the eight MIC licences will be quickly thinned by an unwritten requirement that they show evidence of being active in technology venture financing before licences are allocated. Thus, any expectation that the \$40 million selected for tax-deductible investment in computers will come in a June flood could be sadly misplaced. The MICs most likely to get part of that money have already predetermined largely which of their ventures to bolster.

Sustained efforts by the Federal department of Science and Technology are starting to be rewarded as increasing numbers of government departments come to realise they have a responsibility to give real preference to Australian suppliers as a first step in developing any Australian industry.

An increasing number of local companies are starting to realise that there won't be room for a large number of players in the fiercely

competitive personal computer-cum-workstation market and are directing their research and development efforts into more specialised equipment. The overriding impression is that most Australian computer designs are jumping straight from Z80-based CP/M to 68000-based Unix, with insufficient regard to the market dominance of the 8086 processor family-based IBM PC and MS-DOS.

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**G**overnment departments are starting to realise they have a responsibility to give real preference to Australian suppliers.

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But four of the small number of 8086 family users in Australia — Dulmont's Magnum briefcase portable, Labtam's desktop and multi-user units, AED's dual processor and Ortex's multiple processor systems — are at the forefront of that technology. Our leading indigenous electronics company, AWA, under the guise of its 8602 intelligent color workstation, has developed the first Australian IBM-competitive, conventional personal computer, but has restricted its marketing to emphasise configurations which do not compete with the Corona range of PC compatibles which AWA imports.

One of the biggest indigenous computer manufacturers, David Hartley Computer, which also won fame for getting into and out of major financial difficulties back in 1982, has utilised its long developed expertise with 8086-based dedicated accounting systems to release its own highly competitive personal computer.

It is likely that most of the 8-bit

personal computer companies will offer optional 8086 family processors (or dual 8086/Z80 systems) within the next year or so while retaining the packaging initiatives which have already given them a market identity.

Beyond the "me too" ranks of 68000 Unix, and notwithstanding the recent retreat into receivership of CMAD, Australia's only manufacturer of a locally designed processor, several of our leading-edge technology companies are looking at the emerging alternatives to conventional mainframe architecture.

While the message of the existence of a serious local hardware industry has been shouted loudly in many quarters, it has not yet penetrated the ranks of the real movers in Australia's financial community. Influential investors remain sceptical about the existence of any viable Australian electronics industry, preferring instead to gamble with projects which are safely based on digging something out of the ground.

Unfortunately, such people maintain a deliberate ignorance of trendy reports in the general media, relying solely on performance of the stock market to arouse interest in any serious new opportunities.

To bridge the information gap separating the computing industry — on which all other technology-based industries are increasingly dependent — and the financial community will still require strong action outside the guidelines laid down by free marketers.

All the noise made by many well-intentioned people in support of a local computer hardware industry has established a much more positive climate for its future development. It is now up to the key players, both in industry and government, to show the consistent courage needed to achieve economically significant results.



# HOLD YOUR BREATH LONG ENOUGH AND YOU'LL TURN BLUE!

ALTHOUGH IBM Australia will not admit to more than temporary shortages, a more outspoken IBM management in the UK has made it official that PCs and XTs are in short supply worldwide. There was a touch of irony in the admission, as it followed an announcement of price cuts by up to 20 per cent on those models only several weeks before — and IBM Australia hasn't anything to say on that score either.

In the UK, dealers may now order only 25 machines a month because of component supply problems; some Australian dealers would think them fortunate as there have been instances here where supplies apparently have dried up.

Inevitably, IBM Corp has promised increased production, not only in the US but also at the Greenock plant, in Scotland. Australia is expecting its first PC and XT models to stream out of Wangaratta, Victoria, in July, but production figures are being kept secret and, in any event, a proportion has been allocated to Asian markets.

But, even when all these plants are flowing, IBM is unlikely to meet customer demands for more than a year. On top of this, a personal portable computer (PPC), a 3270 PC, an XT/370, a version of the PC with Unix operating system, and a local area network, or cluster, for up to 64 machines have been announced in the US, but with no shipping dates for the rest of the world. And IBM has aggressively contained much of the competition that could have gained a much stronger foothold in the market.

Although there are several brands of IBM-compatible microcomputers on the market in Australia, dealers and resellers who are authorised marketers of IBM products are reluctant to stock their shelves with the competitive machines, even though they cannot get the supplies

on order from IBM. It is indicative of the muscle which IBM has that dealers would prefer to wait for the original model, particularly as the compatible equipment manufacturers often offer more value for money than IBM both in hardware and software.

In the US, IBM recently demonstrated that it was not prepared to yield shelf space to competitors whose products were too obviously a copy of the PC — both Corona and Eagle have this year agreed in various courts to alter their designs

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***It is for the user to decide how necessary or desirable compatibility is.***

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so as not to infringe IBM systems copyrights, and other compatible manufacturers have been revising their ROM codes where most of the basic intelligence for a machine is held. Another worrying point in the market is not only the possibility of prosecution for infringement of IBM proprietary systems, but also the difficulty in accurately defining "compatibility". Total compatibility involves running all software currently available for the IBM PC-DOS system, as well as accepting the vast number of hardware enhancements and modifications which ingenious innovators in the US keep turning out.

There is no known competitive micro which can meet all these qualifications, although there are some that come extremely close. Others try to stay in the race by using phrases such as "compatible with most IBM software" — a statement which obviously leaves a large margin for error. A difficulty confronting all manufacturers is

whether a wholly compatible machine would be able to compete against an IBM update — indeed, there are levels of incompatibility among IBM's own product range in the short life of the PC and XT.

The usual claim for compatibility rests on the manufacturer having bought a version of Microsoft's MS-DOS, the operating system which was adapted by IBM as PC-DOS. But MS-DOS does not act at all times like PC-DOS and, in the course of marketing, some other anomalies have come to light, such as different disk formats or numbers of tracks, varying storage capacities and densities, and the speed at which the IBM PC operates compared with a lookalike. A "compatible" machine may read an IBM disk, but not be able to format one or run IBM software, so that the user cannot simply interchange floppies from one of these machines to an IBM.

Manufacturers are assiduously working on all these differences without actually getting into court with IBM but, so long as there are even marginal discrepancies, IBM will continue to lead the field. Among the nearest micros to IBM compatibility is the Columbia which will run most PC software, accept IBM PC peripheral cards, and has a keyboard and screen display indistinguishable to the user from the IBM PC.

Essentially, it is for the user to choose how necessary or desirable compatibility is.

But, with IBM's forceful marketing policies which enable it to cut prices to the detriment of competitors, or its determination to supervise its software copyrights more rigidly, competitors may be edged out, and close associations with compatibility — and as a result, a de facto standard for industry and consumer — could be lost.



# WHAT'S HE DOING? POUNDING ON THE KEYBOARD WITH A BANANA!

**RADIO Shack Dept.** Look for the Radio Shack **Model 100 Plus** with an eight-line by 80-column display around June. You can always tell that Tandy is about to roll out a new model or upgrade when it puts the old stuff on sale.

I heard that Radio Shack was **geared up for a big boom** after it ran all those Super Bowl ads for the Tandy 2000. It turned out to be more of a **fizzle** than an explosion. Supposedly the company felt it was because the salespeople at the Computer Centres weren't doing their job — so it put everyone on a **\$25,000 a month quota**. This might cause a morale problem, one observer told me.

I guess Tandy never considered the fact that its ad for the 2000 was ineffective. It sure didn't excite me.

Look for **TI** to bring out a new version of its **hand-held** computer. This time it will work with cassettes rather than with the defunct wafer tape it promised buyers. I'm told that the company may **upgrade** the old units somehow.

Expect to see a **600 x 400** dot-addressable graphics card with 8 to 16 colors for the IBM PC **from IBM** that will standardise the high-resolution color-card business. 600 x 400 is better than the Macintosh's resolution.

I keep hearing the rumor that AT&T will do some sort of **joint venture with Apple** to produce a Macintosh with a Bell logo. Some people suggest that AT&T will simply buy Apple — lock, stock and apple barrel.

**Unwanted at any price theory.** There is some talk that **Unix** may be had for as little as **\$12** (user price) at some point in the future. Maybe nobody wants Unix at any price.

**IBM** added Unix to its PC family at \$900. This price means that IBM doesn't want every Tom, Dick and Harry to own it. **Casual buyers are**

**discouraged by \$900.** IBM is only making it available as a bridge to its **archenemy** — **DEC**. The idea is to lure Unix aficionados over to the IBM camp, then raise the bridge and move them into the IBM operating environment.

The **perceived battle** between Apple and IBM reminds me of the perceived feud between San Francisco and Los Angeles as the "best" West Coast city. This is only important in San Francisco because the **Angelinos** know that the real battle for prestige is between New York and themselves — San Francisco has nothing to do with it. **The real battle** of the late 1980s will be between IBM and DEC for the multibillion-dollar business, not with Apple.

The microcomputer people continually ignore the big picture and **imagine some IBM/Apple battle**. It's hardly a skirmish to IBM. IBM has DEC, Wang, Control Data, AT&T and Japan Inc to contend with.

You have to remember that Don Estridge's first title when the PC was announced under his tutelage was Director of Entry Level Systems. Get the picture?

Look for **Digital Research's** Concurrent CP/M to **change its name** to Concurrent DOS. It will soon be able to run PC-DOS and CP/M-86 programs **at the same time** and store both systems files and programs on the same hard disk. Now that's **finally a good idea** from good old DR. Look for it to make a move on Microsoft.

It's not that I'm intent on watching the **Japanese invade the US market**, but it is pretty obvious at this juncture that it won't be Apple that will give us an alternative to IBM; it will be the Japanese. More than a few people have pointed out to me that it was a good thing that the Japanese haven't hit the US marketplace yet. They would have surely

**been blamed** for the failures such as Osborne, Victor and more than a few to come. There's really only one group to point the finger at — IBM.

Everyone has **lamented** the technological stall created by a shortage of chips and IBM's dominance. So at this point maybe the time is **ripe** for the Japanese to come in with computers that are like their cars — well made, with tons of comforting amenities. I don't think we creative Americans should be **wasting our time** designing clones. **A clone is a clone.** It's like making soup — how much creativity is there in cloning Campbell's chicken noodle soup? It only has so many components (chicken broth, spices, noodles and water), with only a finite number of combinations. We need something completely different that's better than noodle soup.

**New Magazines Dept.** The Whole Earth Software Review magazine just arrived. It's done by Stewart "Whole Earth Catalog" Brand and his band of merry men. I don't know why its mailing address is in San Diego, but its offices are in Sausalito, California. Whatever the case, it's a **very entertaining** little magazine. A year's subscription to the quarterly is \$16. Write: Whole Earth, Box 27956, San Diego, CA92128.

The publication has **no advertising** because this group feels that it **corrupts objectivity**. The staff's objectivity is rather predisposed toward "simple, useful and cheap". Unfortunately or fortunately (depending on your attitude), there is a leftover element of the long forgotten **late 1960s** that permeates the magazine. Listen to this: Steven Levy (Rolling Stone magazine staffer), in a Whole Earth Software Review forum, admits to using WordStar because it helps him "write more organically". What's he doing — **pounding on the keyboard with a banana?**



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#### CURSOR POSITIONING FUNCTIONS

- up cursor position
- down cursor position
- right cursor position
- left cursor position
- back tab
- end of screen
- end of page
- go to page number
- go to place mark
- go to tab
- home
- next page
- next word
- page down
- page up
- previous page
- previous word
- set place mark
- scroll cursor left
- scroll cursor right
- search
- top of page

#### EDITING FUNCTIONS

- auto page numbering
- auto underline—alphanumeric
- auto underline—text
- case significant search
- center
- character insert
- character delete
- copy
- decimal tab
- delete
- document merge
- escape
- external copy
- footers
- hard space
- headers
- hyphen (soft)
- indent
- insert
- move
- page break
- page combine
- page length
- repaginate
- replace
- required page break
- return
- save
- save/exit
- search
- stop print
- strikeover
- subscript
- superscript
- underline characters
- tab
- word wrap

#### FORMATTING FUNCTIONS

- format—change
- format—current
- format—delete
- format—page
- format—system
- format line—replace
- format line set-up
- status line

#### PRINTING FUNCTIONS

- background print
- bold print
- draft print
- enhanced print
- foreground print
- merge print
- printer control codes
- right justification
- shadow print
- stop print
- variable print pitch
- 30 item print queue

#### ADVANCED FUNCTIONS

- column calculations: horizontal addition
- column calculations: vertical addition
- column manipulation—copy
- column manipulation—delete
- column manipulation—insert
- column manipulation—move
- key procedures—create
- key procedures—execute
- key procedures—pause
- key procedures—prompt
- library
- library attachment
- merge code
- spell—check
- spell—edit

#### SUPPORTING FUNCTIONS

- highlight—character
- highlight—cursor position
- highlight—line
- highlight—sentence
- highlight—word
- highlight—paragraph
- on-line help screens
- on-screen shift status indicators

#### UTILITIES

- edit drive defaults
- edit printer defaults
- edit system format line
- print document summary screen
- print queue control
- rename a document
- search document summary screen
- copy a document
- delete a document
- move a document

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## STATE OF THE ART/VIDEO ARCADE

**Video arcades have been waiting for another Pac Man to bring back the crowds. Last month the arrival of the first interactive laser disk cartoon adventure, Dragon's Lair, several hybrid laser disk games and the next generation of computer graphics games began to attract a lot of attention from enthusiasts. Ian Webster spends his last 40 cents on 212 seconds of destruction.**

# The Video Arcade STRIKES BACK

A CONTINUAL supply of new games is essential to the video arcade business. The key component of successful video games is an elusive concept called playability, a combination of the scenario and interaction between the player and the game. Successful games are easily understood by the player, and offer natural control mechanisms and rich variation as play progresses.

The development of arcade games is driven by the introduction of games that offer innovative scenarios, capable of supporting this magic ingredient. Once a scenario has been established and is successful, endless variations and elaborations on the theme are introduced until the market is saturated.

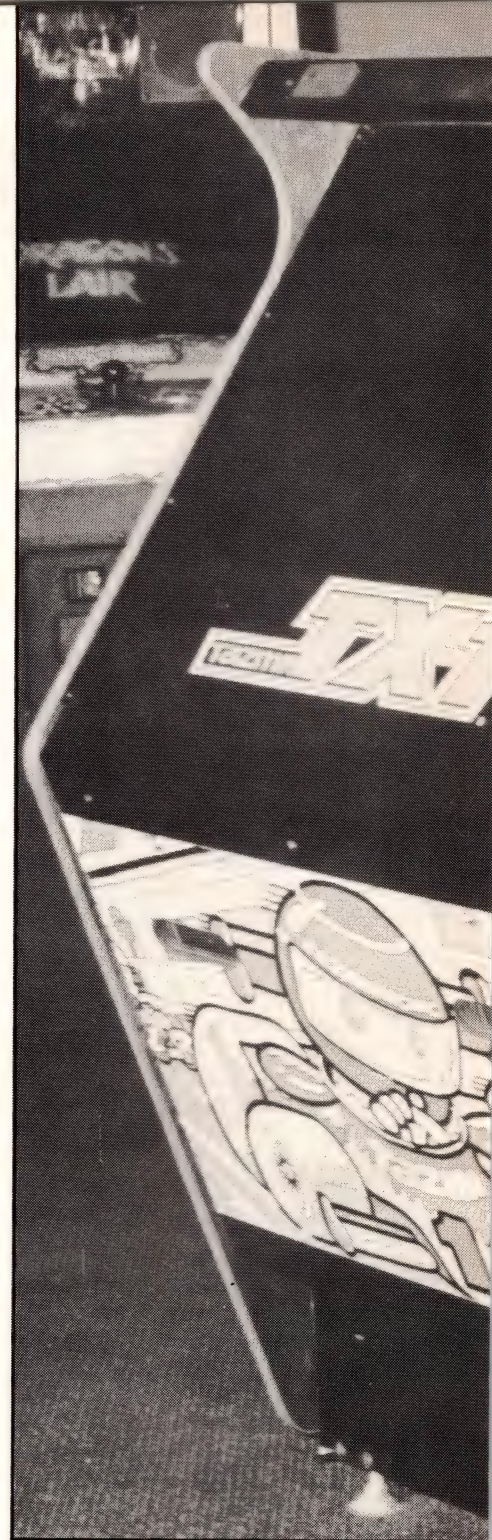
The origins of the video game can be traced back to computer science laboratories and the introduction of the CRT as an I/O device for computers. The first games to appear

were Space Wars and video tennis.

Video games were popularised with the introduction of simple games like Pong, Breakout and racing car simulations as arcade games in the mid-'70s. While Pong was successful in the US, it wasn't as successful in Australia, which had to wait until Space Invaders arrived to establish the video game arcade.

Despite the simplicity of the first video games, Daniel Sudnow's exploration of video game space in his book, 'Pilgrim in a Microworld', shows that most characteristics of the genre were present in these early games. Everything since has been an elaboration of the medium.

Space Invaders was the first soft video game, providing the subtle complexity that is characteristic of the genre. Variations of the theme included the first color video game, Galaxian, and the very successful Asteroids. The game, Defender, char-



acterised the next stage of development, offering a complex scenario with many levels, introducing the important concept of variation in play as the game progressed.

Designers became interested in challenging game players who had the skills to play for extended periods of time, mastering large, complex games.

Most of these scenarios, with the exception of racing car simulation, involved violence and destruction.

The next development established the high point of video arcade activity,





with the introduction of slower strategic games based on mazes and climbing.

Pac Man was the first of these games, which have been elaborated into hundreds of variations. The most important are the many variations of Pac Man, digging games like Dig Dug and climbing games like Donkey Kong, which are especially popular with children and women, who had previously not been particularly attracted to the arcades.

In 1983 the video arcades became concerned at a drop in revenues and

the problems that designers were having producing innovative games. A new technology based on the use of the laser disk was seen as offering a way of improving the quality of the players' experience, using the detail of real video images to enhance the visual and sound experience of the game.

Limited development of laser disk technology, usually interfaced with personal computers, had already occurred with the development of murder mystery adventures and instructional material.

The first laser disk system to enter the arcades was called Astron Belt. It featured a series of video background sequences cut from an old science fiction movie with superimposed computer graphics. The computer maintained a map of the important objects of the changing video image so it could determine when the player's spaceship had destroyed one of the video ships.

The game was immediately successful in arcades because of its spectacular image quality, but soon suffered from repetitive sequences and the



delay while the laser disk searched for the next sequence. Both interfere with the playability of the game.

The next laser disk game to appear in arcades was the long-awaited Dragon's Lair. This game is an interactive cartoon adventure that is based completely on laser disk. The player controls a knight who is searching through the rooms of a castle trying to discover the dragon's lair. In each room, the player must avoid misadventure by moving the knight by using a joystick or using the knight's sword. The animation is superb and the game was an enormous success in the US despite sharing some of the problems of Astron Belt — simple tree-structured sequences and delays between each sequence.

Astron Belt has been available in Australia for some time, but has not attracted a lot of attention. With Australian arcades facing similar problems as their US counterparts, the belated arrival of Dragon's Lair, several second-generation hybrid laser disk games and a new generation of traditional computer-generated games has meant a resurgence of arcade activity.

Apart from Dragon's Lair, the best of the new hybrid games is M.A.C.H. 3, an interactive laser game that provides a low-level flying simulation with computer-generated targets superimposed on the screen. The experience is spectacular, with M.A.C.H.3 extremely popular in Australian arcades.

Two other new hybrid laser disk games, Firefox and Laser Gran Prix, and an updated release of Astron Belt illustrate the problems which surface when not enough attention is paid to the game design.

Firefox is based on sequences cut from the Clint Eastwood movie which have been speeded up in an attempt to put tension into the game. The result is an erratic and confusing game. Laser Gran Prix is a poorly implemented game with an attempt to use a real racetrack image with computer-generated racing cars. It just isn't convincing. Astron Belt still suffers from its previous problems.

Despite the promise offered by laser disk technology, many veteran

arcade players have been disappointed with the performance of the current generation of laser disk games and have been surprised at the quality of the traditional computer-generated games that have just appeared on the market.

### GRAPHICS RULE

Three games, Blaster, TX1 and Discs of Tron, offer extraordinary computer graphics and are a visual experience for anyone interested in the possibilities of computer-generated images.

Blaster is the latest game from Williams Electronics, which has an outstanding reputation for producing innovative but 'over-the-top' games. Blaster is the fastest, most garish space game yet released; it is an experience simply to start the game without even bothering to play. It will become as addictive to serious enthusiasts as the classics of the past.

TX1 is an adaptation of Atari's successful race track game Pole Position. Rather than one screen, three 19in screens are displayed in front of the player giving a sensational wrap-around view of the racetrack. The racing car stays on the middle screen and the scenery on both sides of the track changes as the race progresses.

Discs of Tron is an adaptation of the disk game from the Walt Disney film Tron. The game is fairly complicated, involving several more controls than is usual in arcade games. The computer graphics in this game are superb and, despite the effort needed to learn how to use the controls, it is a very carefully designed game that should succeed.

Hyper Olympics is a successful adaptation of Microsoft's Olympic Decathlon, one of personal computing's classic programs. The conversion of the game to an arcade machine is successful and provides a good benchmark to measure the graphics performance of personal computers and arcade machines.

Other new games will arrive in Australia later this year.

Cliff Hanger is an interactive laser disk cartoon adventure similar to Dragon's Lair. The story is about the attempts of Cliff to rescue his girl-

friend from an evil count. Prompts indicating when to move the joystick are displayed at the bottom of the screen making the adventure easier to play than Dragon's Lair, but it still suffers from delays between scenes as the disk searches for the next sequence.

An innovation in several games is the use of laser disk to store backgrounds that have been generated by using computer graphics, rather than using real images. In a hybrid laser disk, computer-generated game, this technique offers the advantage of complex computer graphics backgrounds that an arcade machine computer could not generate, which in turn complement the computer-generated game.

Cube Quest and Interstellar use this approach with a Japanese computer graphics company providing the video wallpaper. A conventional game is floated over the top. While the background images are fantastic, the games suffer from ordinary game implementation.

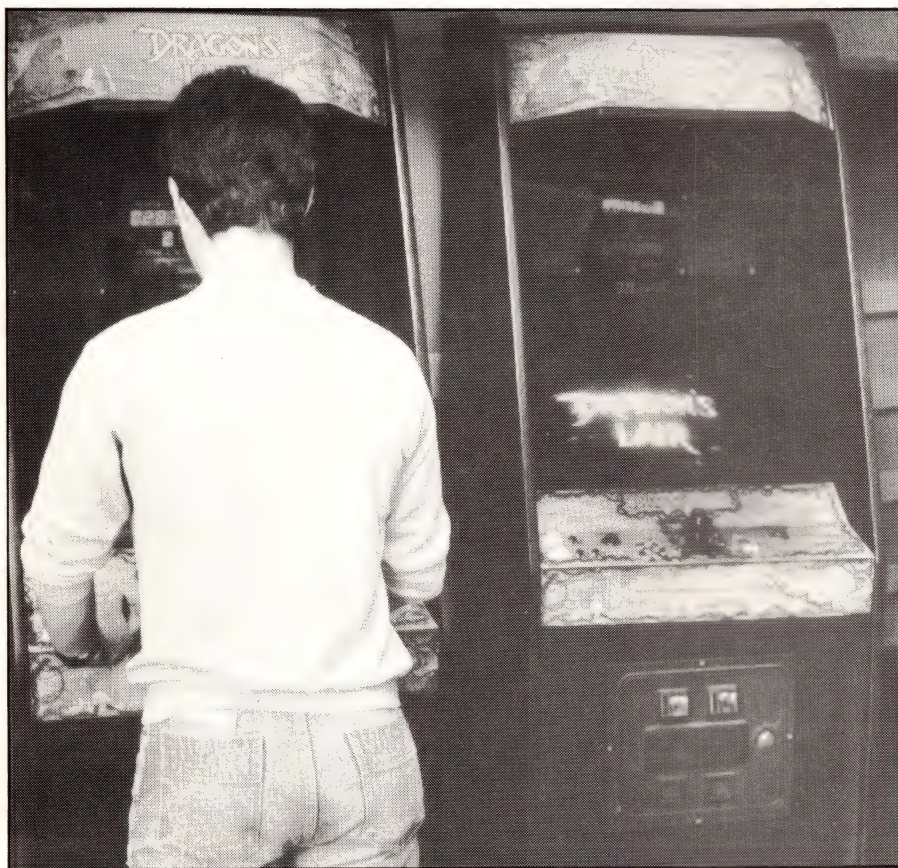
### GETTING IT RIGHT

Star Rider is Williams Electronics' first venture into laser disk. The cabinet is constructed like a motor bike seat with all controls on the handlebars of the bike. The screen shows a road that moves through ever-changing alien landscapes generated by the laser disk. A rear-view mirror at the bottom of the screen enables the player to avoid the traffic coming from behind. This is the most successful of the laser disk/computer generated hybrid games offering the complexity and speed that has become the Williams Electronics style. Hybrid arcade games of this quality will become a standard in arcades over the next few years.

Traditional computer-generated games yet to arrive are mainly variations on the successful themes of the past, with Pac Man Jr, Mr Do's Castle and Donkey Kong 3 offering some appeal to fans of their predecessors. Only Pac Man Jr offers an interesting variation, with a scrolling maze that is sure to become a home computer game this year.

This new generation of games will revive interest in the arcade for a few





**Two interactive, laser disk, cartoon adventure Dragon's Lair machines in a Sydney arcade.**

months. Most will appeal to dedicated arcade players rather than attract new players. Many enthusiasts who have been waiting for laser disk games to appear have been disappointed at their playability.

While Dragon's Lair is successful, it isn't really suited to the demands of the 20¢ coin. The speed at which the game must be played because of 'time is money' economics is a problem for many potential players.

The hybrid games are also disappointing, but M.A.C.H. 3 and Star Rider show what can be done by sympathetic designers concerned about the playability of the game. An important point that should be noted about the development of laser disk games is that they are all oriented towards a teenage male audience. The game scenarios adhere to the early development of the video arcade game with death, destruction and violence dominant.

The development of maze and climbing scenarios was very important in broadening the appeal of arc-

ade games. These scenarios usually involve a slower strategic game. When they are adapted to the laser disk format they may produce a better game than the static decision tree of the laser disk adventure or the relentless destruction of the hybrid space action game.

### **FUTURE SCENARIOS**

Two innovations that designers have yet to deliver are effective multi-player games and the sensuround experience. Despite considerable interest in multi-player games, it seems that the requirements of the video arcade mean that multi-player games are not economically viable. Enthusiasts will have to wait for the development of extensive public communications systems networks before this type of game is widely available.

Considerable progress has been made towards the sensuround experience, with most new arcade games built into cabinets to provide a controllable playing environment with multi-track sound, computer

voice and low-frequency vibrations. The legendary founder of Atari, Nolan Bushnell, is known to be interested in this approach for future arcade games, and his Sente company is expected to unveil an advanced sensuround machine towards the end of the year.

Many of the new computer-generated games will be ported across to home computers. An emerging problem is that the hardware and software technology of the arcade game has advanced much faster than that of the home computer, so it is becoming much more difficult to bring all features of the arcade game down to the home computer.

Despite continuing sales of home computers, a technology window is opening for the development of a home computer that has enough processing power and color graphics VLSI to support quality entertainment environments. While the installed base of color television sets remains incapable of displaying a quality computer-generated image, this development is likely to be slow.

Most of the new Japanese MSX home computers are capable of interfacing a video disk player, and the entry of the Japanese into the home computer market with integrated home entertainment systems in the second half of the decade will bring laser disk games into the home.

Dragon's Lair and similar adventures are much better suited to the home than the arcade. They will become a major entertainment genre. Hybrid games will also be popular, but will be much more important in the arcade as they become the basis of most advanced arcade games, particularly ones that involve sensuround components.

This new generation of arcade games provide some of the best computer graphics around (not counting commercials on television) and provide an opportunity to see and feel computer-driven video disk. These new games are not yet widely distributed in video arcades. In Sydney they are only available in the arcades next to and opposite the Hoyts Entertainment Centre in George St. In other capital cities, try the newest and largest video arcades.



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**The debate about the place of computer-based technology in our society has avoided considering the consequences of intimate relations between the technology and the human species.**

**Ian Webster reviews Geoff Simons' attempt to make a case for granting computer-based machines the same considerations we give to other life forms.**

# Are COMPUTERS Alive?

GEOFF Simons, chief editor of the National Computer Centre in the UK and author of several books on computers, has written a book 'Are Computers Alive?' to argue the case for considering computer-based machines as an emerging species, *machina sapiens*. The book is part of a long-running discussion about the relationship between humans and machines that has become submerged in the scramble to ensure that people are not scared of the computer-based technology, about to wrap us up in its electronic arms.

People have speculated for thousands of years about the nature and meaning of the technological extensions of the human species. While these extensions have been the central component in defining the living environment of the species, only technological cultures have emphasised the separation of these extensions from the domain of life.

This objectification of technology provides the leverage to organise the energy and information flows necessary to institutionalise progress and growth.

During the second half of this millenium, there has been a fascination with the apparent capacity of technology to imitate some functions of life, and appropriate myths have been constructed to accommodate the possibility of creating machines in the image of the species.

In this century, the possibilities have become part of everyday life, constantly reflected in the mass media.

The past two decades have seen the development of computer-based technology to a stage where building intelligent machines is a goal for many computer scientists. At the same time, a shift from concerns with separation, energy and action to an interest in organisation, relationship and difference has caused a reassessment of our understanding of the world around us.

Simons' book uses this reassessment, as applied to the criteria for life, to ground his argument on the respectable side of science.

He quotes J.D. Bernal, who regards something as alive if it contains "a self-reproducing molecular system," but also considers life as "a partial, continuous, progressive, multiform and conditionally interactive, self-realisation of the potentialities of atomic electron states." This definition is not limited to particular biochemical substances, structures or behaviors. Simons says that the generality of this statement implicitly

admits the possibility of life forms not based on familiar hydrocarbon metabolisms. He then strikes home with a further Bernal quote: "Life is essentially, therefore, a matter of the growth and self-complication of the informational aspects of the potentialities of matter."

Having established this tenuous hold, he proceeds by suggesting that modern, cognitive science has led the way to considerations of life independently of how the various subsystems that support life are realised. Life does not have to be based on a specific chemistry, but can be recognised in any system that satisfies life criteria. He argues for the life criteria of structure, energy processing, information processing and reproduction.

Next he throws in a quick chapter to reassure the reader that people have begun thinking about the possibility of machines that live for centuries. He doesn't explore the cultural context of this speculation, but simply attempts to demonstrate the ready acceptance of the possibility of machine life.

The next three chapters follow familiar ground to readers of popular books about computers, as Simons offers a tour of the accomplishments of artificial intelligence, robotics and advanced software design. He claims that the results of this work indicates that computer-based machines can

### **Are Computers Alive?**

**By Geoff Simons**

**The Harvester Press Ltd, 1983**

**Price: \$22.95**

**Review by Ian Webster**



satisfy his four criteria of life. As usual in popular discussions of robotics and artificial intelligence, what has been done, what is being done and what could be done is merged into a vision of what people hope to do.

He ends the book with two chapters that investigate the consequences of acknowledging that computer-based machines are emerging life forms —

that is a good place to start for anyone interested in these ideas.

Simons' comments about the type of culture that will accept living machines are very important. Despite the enthusiasm of some people in our society for computer-based technology, there is widespread disquiet about the technology. Computer-based technology pre-

but duplicated. A child learning a new word may first, in attempting to pronounce it, mimic a parent; but when the word is used with ease, and in manifest conjunction with the appropriate cognitive mental states, we no longer talk of mimicry. It follows that, where computer models and simulations are sufficiently developed, they represent a duplicating, rather than a mimicking, of the behavior of living creatures; it is difficult, for example, to see how a chess program that consistently beats its creator can be said to be mimicking the behavior of the human programmer.

"The 'Argument from Entropy' has, as popular variants, the claims that 'computers only do what you tell them' and that 'you can't get more out of something than you put into it'. These types of claims suggest that computers can never be truly intelligent, creative, take initiatives, choose freely, etc. But today there is abundant evidence to the contrary (some is given in the present book), and the fallacy in the entropy argument can be shown by considering how it used to be applied to life itself.

"It was argued that the Second Law of Thermodynamics (which suggests that natural processes necessarily produce a greater degree of disorder) was in conflict with biological evolution (which produces more highly ordered systems, that is, living creatures), but the Second Law only applies to a 'closed' system, and within a portion of the system there can be a decrease in local entropy. What this means for our purposes is that, just as it has been possible for human beings to acquire similarly a range of creative (and other) abilities, computers do not only do what you tell them, they sometimes do more — you sometimes can get more out of something than you put into it. **m**

## **Most current US discussion about computers and life has focused on the hybridisation of the human species with computer-based machines.**

one chapter on the rights that should be accorded to machines, the other on the human response to machine life. He ends the latter with the important observation that, where the human species is viewed in mechanistic or materialistic terms, it will be easy to embrace the notion of machine life. Where the species is regarded as at least partially spiritual, there will be more reluctance to acknowledge the arrival of living machines.

Are Computers Alive? is a useful attempt to bring together some strands of a debate that will become very important. It is, however, a disappointing book, largely because of the author's attempt to deal with computer-based machines as discrete life forms.

Most current US discussion about computers and life has focused on the hybridisation of the human species with computer-based machines. Rather than machines themselves evolving through to the self-organising stage, the human species may provide the necessary impetus much more directly.

The book has a useful bibliography

sents the question: "What does it mean to be a human being?" in a way that cannot be ignored.

As the technology invades our society, people who regard the technology as anti-life in the same way that the nuclear industry is regarded as anti-life will express their opposition.

For those readers who are bemused by the idea of computers and life, here is a brief consideration of the two common arguments against the possibility of machine life from Simons' introduction: The Argument from Mimicry and The Argument From Entropy.

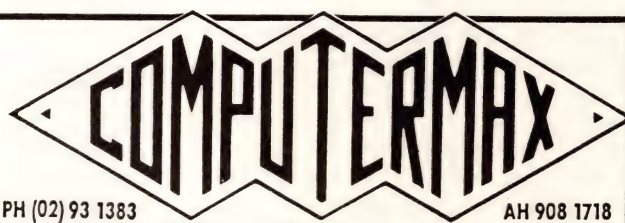
"It is often said that computers and robots are not really intelligent (or alive), that they merely mimic the behavior of human beings or other animals — as might a puppet or a clockwork doll. But this is partly a matter of degree: it is arguable that, where the mimicry is highly successful, and moreover extends to more than one area of behavior (for example, goal-directed behavior plus demonstrable elements of cognition), the behavior is not simply mimicked

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**DOORWAYS** — You can move from ROOM to ROOM through DOORWAYS. META4 automatically relates information in one ROOM to information in the next.

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\*Apple Users Society of Melbourne







**TeleVideo has folded its attractive terminal design into a range of microcomputers. Tony Smith reviews the TeleVideo 1603 and discovers a network that works.**



# **A NETWORK SOLUTION: TeleVideo 1603**

TELEVIDEO Systems Inc of Sunnyvale, in the heart of California's Silicon Valley, first came to notice as a manufacturer of quality terminals to run on other suppliers' multi-user systems, especially minis and mainframes. Next to most personal computer manufacturers, that background gives a picture of a relatively old and conservative company. But, in this case, nothing could be further from the truth.

TeleVideo was listed in the Top 10 on some measures of computer company growth in the US last year, an unheralded performance behind such high fliers as Convergent Tech-

nologies, but most impressive all the same.

TeleVideo produces only two personal computer chassis designs: the extremely asymmetric desktop version exemplified in the 1603, the newer IBM PC and XT compatibles, and single and multi-user 8-bit systems; and a contrastingly symmetrical "luggable", which is offered only as a PC-compatible or an 8-bit.

The appearance of the 1603 (and the other desktops) can only be described as distinctive. It gets a mixed reception from people; some quite like it, while others are indifferent, and a substantial number strong-



ly dislike it. This reviewer makes no apology for leading the last category.

The one thing indisputably going for the desktop design is its clear 14in display compared with the prevailing 12in varieties — just the kind of initiative you would expect from a highly reputed terminal manufacturer.

As the third 8088-based machine I have had to review, it was initially easy to dismiss as “yet another computer”, especially after the novel features in the Dot portable, and Canon AS-100's sensational color graphics. I had to look quite a bit deeper to find the things that are winning sales for the TeleVideo, uncovering one important advantage as well as several other interesting features.

The key strength of TeleVideo personal computers is that they were designed together with their own local area network, thus avoiding all the pitfalls of having to work with a network that had been added as an afterthought. While it was not sensible to install a full network system for review, I was given the opportunity to inspect an installed network at a user's premises which had a mixture of 1603s and the original TeleVideo single-user 8-bit 803s.

The interesting points were the use of the same chassis for a range of

tems is that the 16-bit systems need well over 256K-bytes to show up strongly. It is certain that TeleVideo's reuse of most of its 8-bit design, including all the visible features, in its pseudo 16-bit versions is a trend which will soon be followed by other significant 8-bit vendors as they concede to the hype surrounding the IBM PC.

## HARDWARE

The 14in tiltable screen hangs off the left-hand side of TeleVideo's vertically mounted twin disk drive-cum-processor module. The frame which runs below the screen to support it ends in an oversized tightening knob for tilt control.

While the detached and adjustable keyboard connects at the front of the processor box, it runs untidily through a small hole in the box and connects some distance away on the inside of the cabinet, the cable only separating at the keyboard end.

The keyboard has the advantage of a wide palm rest, but the provision of 16 function keys immediately above and the same size as the main alphanumeric keys is overkill. Shift operation provides 32 programmable functions in all. Keyboard click is selectable by setting a DIP switch.

whole area of the processor unit in such a position that it has to be removed to get at the power supply which sits in the strange bulge at the rear of the unit. This, in turn, is shaped to fit around the tapered back of the screen. The processor is yet another 5MHz 8088 — it is no wonder Intel is having trouble keeping up supplies.

Standard RAM is 128K-bytes upgradable on board to 256K-bytes, with 4K-byte bootstrap and diagnostic EPROM. The 32K-byte video RAM required to provide bit-mapped graphics is an option.

The small square backplate of the video screen section can be removed with only two countersunk screws providing an opening which exposes the minimal amount of discrete circuitry required to drive a monochrome monitor. But it does not provide a big enough opening for a faulty picture tube to be removed. It is necessary to remove the backplate to make adjustments to four important video controls.

The communications ports are positioned outside the rear edge of the processor board — two RS232 serial ports for printer and modem, an 800K-baud RS422 port for networking and a connection for the optional optical mouse.

While the three-button optical mouse and its pad were not provided for the review; they had previously been tried out attached to the 8-bit portable model, when the lack of moving parts did not seem to compensate for the simplicity of operating a single-button, mechanical mouse. Above and below the ports are two rows of DIP switches, one of which has to be reached to change between network and local operation.

The only real faults noted were with the disk drives. Pushing on the appropriate spot on a closed drive door only intermittently released the disk inside. Otherwise it was necessary to reach in behind the edge of the depressed door and pull it open.

There was also one strange but reproducible failure on an individual diskette, unfortunately within the CP/M-86 operating system code file, which could only be removed with a reinitialisation of the disk.

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***The key strength of TeleVideo personal computers is that they were designed together with their own local area network.***

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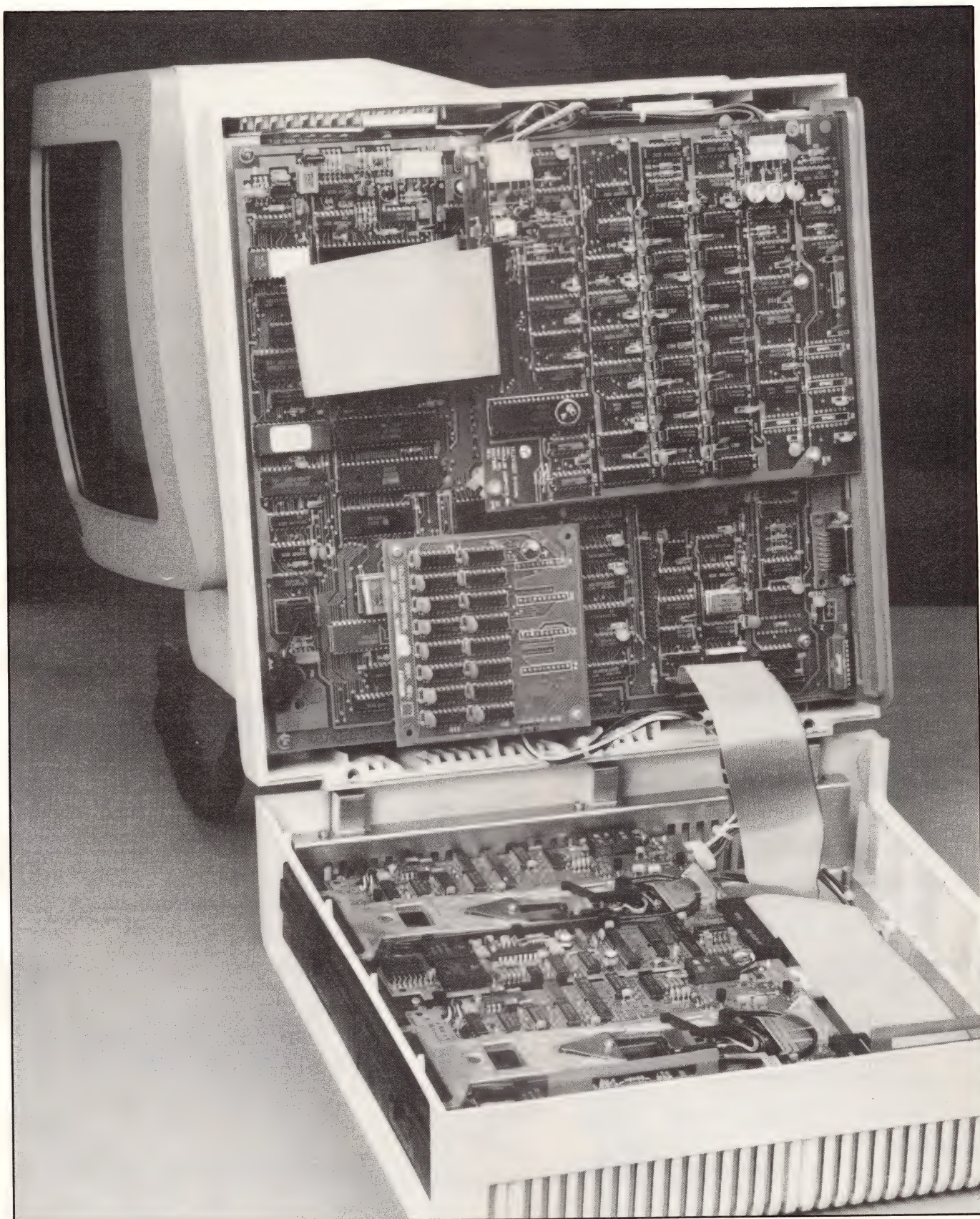
products which would usually be regarded as needing different designs, and the effective performance of TeleVideo's Australian distributor, Data Peripherals. In reality, the differences between the new, fast Z80-based 8-bit systems with bank-switched memory running under CP/M 3.0 or MP/M II are little different from 8088-based systems with the same 8-bit external data path and typically containing a maximum of 256K-bytes of RAM.

The only significant software differences between 8- and 16-bit sys-

The disk drives can be separated from the rest of the processor box for service by extracting three deeply countersunk phillips-head screws in a position below the drives which requires the unit to be hung off the edge of a bench while unscrewing, then moved back on to the bench before the drives are allowed to fall away. The dual 5¼in drives use double-sided, double-density disks formatted to 737K-bytes each, but are also able to read single-density disks written on a TeleVideo 803.

The processor board occupies the





The vertically mounted motherboard with graphics and memory options.



*Australian*  
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**HARDWARE REPORT CARD**

TeleVideo 1603

	Poor	Fair	Good	Excellent
<b>Performance</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Documentation</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Ease of Use</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Error Handling</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

#### CPU

- Intel 8088 (5MHz)

#### Memory

- 128K RAM, upgradable on board to 256K.
- 4K bootstrap ROM.
- optional 32K video RAM.

#### Disk drives

- dual 737K 5¼in floppy disk drives.

#### Interfaces

- 2 x RS232 serial.
- 1 x RS422 SDLC 800K-bit/sec network interface.
- 1 x mouse (optional extra).

#### Keyboard

- detached, low profile, palm rest.
- 16 programmable function keys.
- numeric pad, cursor keys.

#### Display

- 14in P31 non-glare green phosphor, tiltable.
- 15 lines x 80 char, 7x8 pixels in 8x10 cell.
- 640 x 240 bit map graphics optional.

#### Operating system (s)

- CP/M-86, optional MS-DOS 2.0.
- MmmOST proprietary networking system.

#### Price

- \$4463 including tax.
- six-user 20M-byte network server \$10,781.
- 16-user 40M-byte with streamer backup \$19,199.

#### Distributor

- Data Peripherals, 9 Avon Rd, Nth Ryde, NSW 2113. Tel: (02) 888 5733.

The organisation under those headings left a bit to be desired, with macro assemblers and code generators being included under "utilities" while there was a separate heading for "languages".

## SOFTWARE

The only bundled software is a word processor and spreadsheet, jointly referred to as Telesolutions-86, which are adaptations of Chang Lab's Docuplan and Microplan. Other Chang Labs products related to Microplan are a prominent feature of the additional software offerings.

While MS-DOS is offered as an option, there are only 25 products on that software price list, compared with more than 90 for CP/M-86. Networking is provided by TeleVideo proprietary MmmOST host operating system which runs on the central (8-bit, hard disk) station of a six or 16-user star network, the downloaded CP/M operating systems containing a modified BIOS able to make appropriate network calls.

The record locking capabilities provided by MmmOST can be accessed from RM-Cobol, Optimum database management system and MS-Basic-86. (The dominant multi-

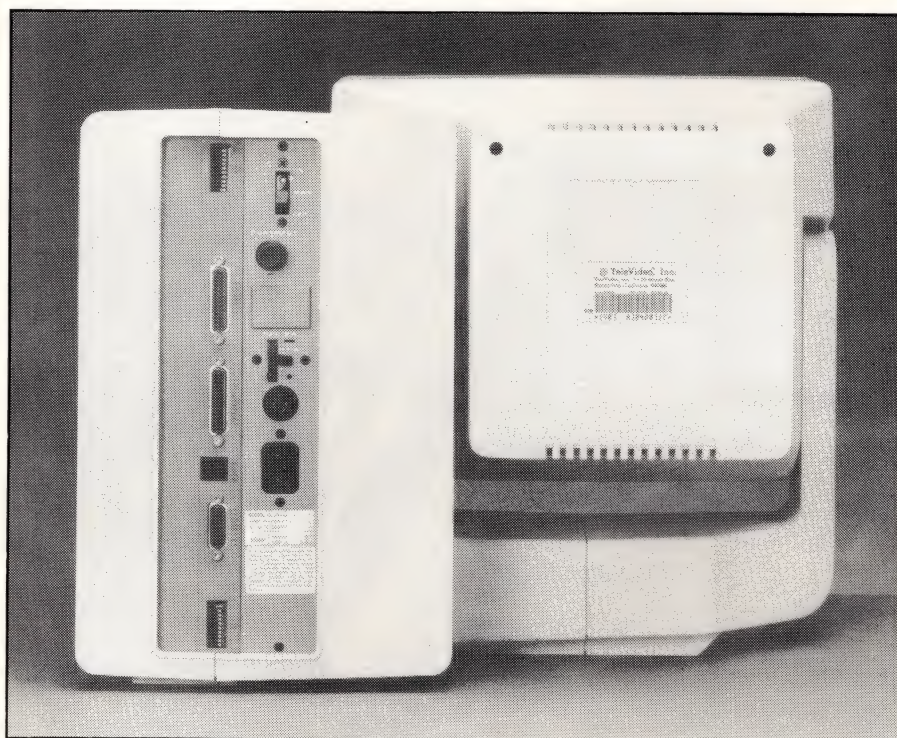
user networking operating system TurboDOS has been listed as available only for 8-bit TeleVideo networks as an alternative to MmmOST.)

It was necessary to run a program called graphics to initiate the GSX graphics kernel under CP/M-86 but, in the absence of any documentation on how to make GSX calls from convenient locations, I looked at some capabilities only on a demonstration program. The Basic provided under CP/M-86 was significantly different to Microsoft's, with some very powerful string searching and rearrangement functions.

The MS-DOS was Version 2.0, providing a reminder of the power of sub-directories, file path names and submit (batch) routines that are typical of operating systems of large multi-user computers.

## DOCUMENTATION

TeleVideo's original contribution is an introductory manual for the system which sets out to explain points to an uninitiated user, such as what on earth an operating system is. For novice users, the manual appeared quite good, but it left the problem of providing the right level of infor-



Connectors include network, printer and RS232C.



mation to a broad range of users, some of whom have had enough experience with computers to know everything except where to find the answer they need in an introductory manual.

Other manuals were minor adaptations from software vendors, packaged in three-ring binders or spiral bound. The manuals provided were all A4 format, except for a modest list of software suppliers, describing almost 150 products under 13 headings, followed by price lists.

## INSTALLATION SUPPORT

Installing the 1603 was simplicity itself. It was taken out of the box, the keyboard and power cable plugged in, a system disk inserted and the unit switched on. When the disk error occurred, prompt and effective support was provided; hardly surprising in view of the use the machine was being put to.

The network user reported that, despite the common problems associated with very rapid growth, Data Peripherals' support had reached an acceptable level after only a moderate amount of table thumping.

## CONCLUSIONS

There is no obvious factor to isolate the TeleVideo 1603 from a host of other machines as a single-user micro, unless there was an extraordinary requirement for its marginally better-than-normal screen clarity. Any decision to buy a single system would thus have to be based on special confidence in the manufacturer and its local distributor, both of whom appear to do a good job.

But if you require multi-user capability through a local area network, it is almost in a class of its own as an affordable solution, with network integration at the design stage not as a clumsy afterthought.

For conventional, commercial processing and development of original multi-user software, a network of 1603s, possibly mixed with other TeleVideo models, is a particularly attractive proposition, more so if you happen to like their strange appearance. **m**

# THE MIX AND MATCH NETWORK

TO INSPECT the operation of a 1603 in a network situation, I was invited to visit the Department of Civil Engineering at Melbourne University.

As well as installing a network of 18 Sirius microcomputers for computer-aided design by undergraduates, the department saw staff and post-graduate students had a need to use personal productivity tools and specialised microcomputer applications for several years before introducing such facilities to undergraduates.

The exhaustive selection process leading to TeleVideo being chosen quickly identified the preference for a local area network ahead of conventional time-shared multi-user systems because of LAN's relative avoidance of performance degradation as extra users are added. The short list was cut down to two similar systems of networked personal computers, with TeleVideo winning out because of its larger central disk capacity.

The configuration selected was a 16-user system with a 33M-byte formatted Winchester disk, divided into logical drives A: B: C: and D:, and 14.5M-byte streamer tape for backup. Initially, four users have been installed: two 1603s and two Z80 CP/M-based 803s, all of which happily share the central resources including the printer queue which currently serves one common printer but can handle another.

The network operating system was expected to provide some level of multi-user protection but not comparable to a mainframe system. With users being "responsible academics," there was no need for greater protection. None of the applications so far has called upon the record-locking capabilities of the network operating system.

The artificial economics of

internal university funding have had a hand in many aspects of system selection and use — from notional charges for use of computer centre resources to the slow introduction of desired software packages and a decision to re-use cabling already laid within the Civil Engineering building rather than buying the recommended cabling at \$2.50 a metre. They encountered no problems operating a station 120 metres from the central network server using pieces of old cabling joined by several plugs.

The purchase of computer equipment had to compete with demands for conventional engineering laboratory equipment. Funding limits initially restricted the purchase of such packages as WordStar and Multiplan to the 8-bit versions.

One application of Multiplan was to balance the workload of six Structural Engineering branch staff members who had a mixture of lecture, tutorial, practical and excursion duties for classes from Years One to Four.

It was planned that users would generate much of their own software as well as gaining access to programs developed at other institutions in the same field. Basic and Fortran source code was expected to be able to be compiled to run on both 8 and 16-bit systems with a minimum of changes. Loading programs via the network had been found to be from three to 10 times faster than loading from the local floppy disk at each personal computer.

But changes in the local operating system BIOS to accommodate connection to the network apparently left less user space than in standalone mode, as some spreadsheets originally developed locally could not be reloaded while connected to the network.





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multi-user computer micro systems and independent manufacturer of terminals. And is presently rated as the growth leader in the data processing market.

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also be maintained across the Pacific.

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Monitor.	Yes	Optional	Yes	Optional
Screen size.	14"	12"	14"	12"
Tilt Screen.	Yes	No	Yes	No
Quiet Operation.	Yes	No	Yes	No
Memory (Std).	128K	64K	256K	128K
Graphics Display (640 x 200 resolution).	Yes	Optional	Yes	Optional
Printer Port.	Yes	Optional	Yes	Optional
Communication Port.	Yes	Optional	Yes	Yes
MS DOS/BASIC.	Yes	Optional	Yes	Optional
System Expansion Slot.	Yes	Yes	Yes	Yes

Data Peripherals.

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**Statistics packages are difficult to write as they involve a user friendly data management and validation front end combined with careful, rigorous analysis of the data.**

**Users of statistical packages are even more difficult, demanding speed, performance and an endless list of features. Bill Fitzgerald reviews Abstat+.**

# LIES, Damn LIES and STATISTICS

IN A nutshell, Abstat 3.0 is a neat and tidy statistical package which is pleasing to users provided they can work within its major constraint: number of variables by number of cases must be less than or equal to 2776 on a CP/M Z80A microcomputer with 64K-bytes of memory. But more on this later.

Abstat can be supplied on most disk formats for CP/M Z80-based microcomputers and comes as a stand-alone package. It needs no other language such as Basic 80 (it is also available for CP/M-86 and MS-DOS). This to me is an immediate advantage, as it invariably means it will run faster than a secondary language-based package such as NWA Statpak.

Abstat consists of a main ABSTAT COM program with some 20 overlay modules attached to it on disk, very much like the dBase II system. The programs take up 280K-bytes of disk and need not all reside on the default drive: the INSTALL program's sole job is to tell Abstat where its overlays are. I was able to easily fit the package and 80K-bytes of data on disk A of my Otrona Attache.

How friendly is the user interface? It's cuddly, but not overly affection-

ate. I was able to use it first up without the manual with a little patience. The system is a Teletype terminal menu-driven system — the menus scroll up the screen using line feeds; there is no use of cursor control or even Home and Clear to end-of-screen and the INSTALL program consequently doesn't ask for any terminal capabilities.

The ONLINE Help facility is good but not generous and is invoked by either a "?" which gives you a listing of the major command groups or a "<command>" which lists all the help on that command. The commands are sensibly named and easy to remember — PRINT for printing, READ for ASCII data read, DBREAD for dBase II data read and FREQ for frequencies (the commands must be in capitals).

All commands can be abbreviated to four characters and most extended commands such as "READ <file-name>" can either be entered as such or as READ and it will then ask for the file name. When specifying particular variables for analysis, the ALL variables is always a "\*". Most commands can be interrupted with a "Ctrl C" which causes an Operator Abort command and returns you to

the main command line — nice. The commands are simple and consistent, and have been well thought out.

The Appendix contains a well worked over Example data entry, Edit and descriptive statistics session for the first-time user — a definite plus, and the example works! Error handling is tidy. Any error generates an error number with a two to four-word online description and returns you to the command line of Abstat, none of this aborting to CP/M monitor level here thank you.

Appendix C contains a detailed listing of the same 99 codes. These are also well thought out.

With the above in mind, the intended audience for Abstat is anyone who wants easy access to simple statistical analysis, a minimum of command language learning, quick answers on small data sets and has little or no programming experience.

The documentation is well set out, each command being described using the same template. The descriptions are adequate and brief, most commands being covered in one or two pages. The 91 pages contain a table of contents and a simple index. There are six major sections: General Information, DATA



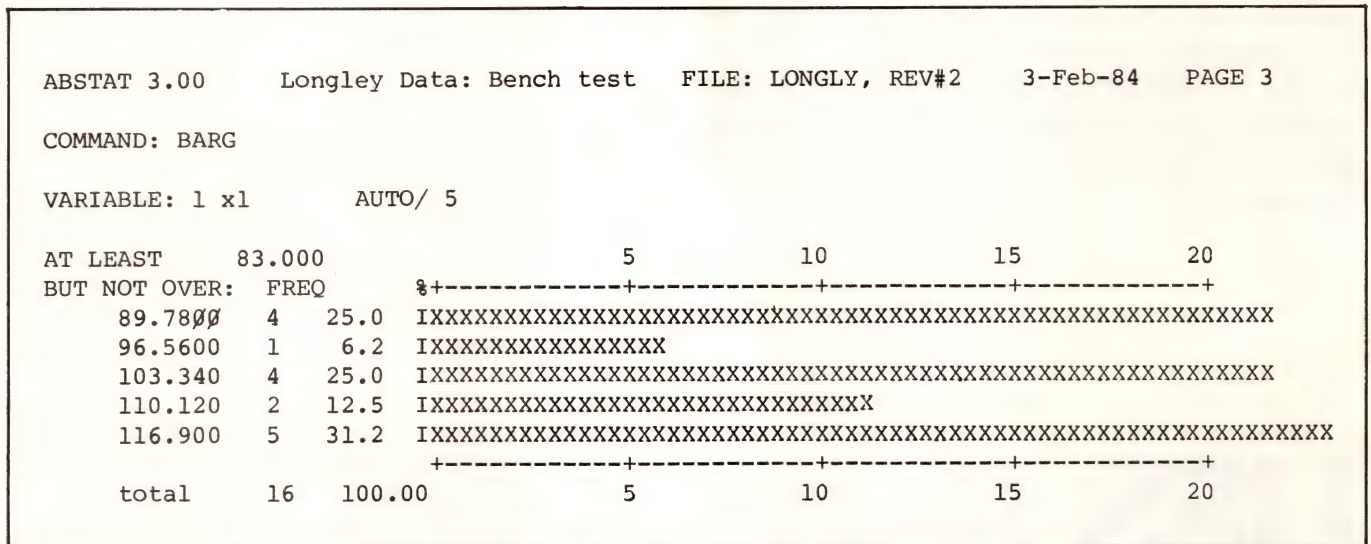


Figure 1: Frequency plot of Longly data.

SET commands, REPORT commands, STATISTICAL commands, GRAPH commands, and MISCellaneous commands. Appendix A: Installation and Example; Appendix B: Computational Formula; and Appendix C: Error Codes are included.

Let's start from the back, the only way to look at documentation.

The computational formulae are inadequate for a nosy person like me to precisely determine which numerical algorithms are being used on what statistics. The formulae quoted are loose versions of standard statistics textbooks and are incomplete: there are none for the descriptive statistics or for the correlation analysis — not good, as it impairs the package's statistical pedigree.

The three miscellaneous commands are not miscellaneous. Firstly, the DIR command gives a SORTED listing of any files on any disk while inside Abstat — excellent for those files forgetful people like me; was it ADSC.DAT or ADCS.DTA? The DIR command is exactly the CP/M command — excellent. One neat trick; the DIR command does a CP/M disk reset so you can interchange data disks while in Abstat and be able to write on them.

Second, the INSTALL command allows a user with restricted disk space to tell Abstat where its overlays are and nothing more! On large floppy systems or hard disk systems, you'll never use it.

Now, the really non-trivial com-

mand, COMM. This is a handy, simple macro program processor. It allows you to place all the expected console commands for a suite of operations into an ordinary ASCII file via an editor and then execute them from inside Abstat — an excellent feature for those situations where you do the same analysis each month on a new monthly data set.

The example command file supplied "DEMO.KMD" when executed by typing COMM DEMO.KMD whizzed away, read some demo data, did descriptive statistics and a crosstabs — all with me watching like Alice — wonderful.

How about pictures? The BARG and PLOT commands allow basic bar charts/histograms and bivariate scatterplots and that's the sum total of plotting. The commands are well implemented with the facility for either AUTO scaling or user defined scaling. Some output from the Longley data is contained in Figure 1. It's not the best set out I've ever seen, but adequate for its purposes.

While I've got some output, Abstat has five Report commands. They allow you to put basic labelling information on each page. This includes the DATE command and a TITLE command allowing up to 64 characters of page titling information.

Abstat automatically places the page number and the name of the DATA SET in use along with its revision number. This number is maintained inside the Abstat binary

data file. These commands allow you to meaningfully document your output for the day six months on when you ask your research assistant: "What's this printout about?". This page documentation is on top of the simple variable naming of eight characters allowed by Abstat (alas, no VAR labels or value labels for the verbose SPSS hackers among us).

The other three report commands are: PON to define the output device or filename to be either 80 or 132 columns wide (this is useful for placing analysis results into a report via a word processing package); POFF to toggle the printer on or off; and TEXT to incorporate a disk file of text into the output (this is excellent for fully documenting output).

Abstat handles all its data entry and manipulation in memory; the user defines a data structure of up to 64 variables, and then either enters the data from the console or reads it from an ASCII or dBase II data file. This approach makes data transfer from one package to another easy, but there is a strict and unchangable limit placed on the number of data cells available in memory for analysis.

Specifically, a standard 64K-byte memory CP/M Z80 micro has around 56K-bytes of user-available memory after CP/M takes its 8K-bytes. Abstat takes a further 3.8K-bytes leaving only 52.2K-bytes usable as data. This equates to one variable and 2776 cases or 50 variables with 55 cases.

The Abstat manual claims that the



maximum number of data cells is 4000 for a 64K-byte system, but neglects to add that this 64K-byte must be all available to the user after CP/M and Abstat have taken their cut. The practical limit is 2776.

The fifteen data definition commands can be divided into four general groups as follows: Abstat default binary data file creation and retrieval (CREATE, FETCH, EDIT and SAVE); Data file utilities (SORT, PRINT and RAND); data file transformations and selection (TRANS, BUILD, PULL and APPEND); and ASCII & dBase II data file reads and writes (READ, WRITE, DBREAD and DBWRITE).

A typical work session with Abstat begins by either creating (CREATE) a new data structure or fetching (FETCH) a previous Abstat binary data file (referenced by the .SDF extension). Abstat can only handle one data structure at a time and the edit (EDIT) facility is easy to use and surprisingly powerful — you can go to a specific case in a specific variable and alter a value, or list all cases by variable. Each time an alteration is made, a new version number is created by Abstat and, if saved (SAVE) as a .SDF binary data file, will be kept for future reference. The CREATE command is also used to create an empty or zero file for later use with any of the data input commands.

When creating a new data file, you are asked for the number of actual and reserved variables you will need. The actual variables are those you intend filling initially with real data. The reserved variables are those reserved for temporary or transformed variables. But beware . . . If you reserve too many temporary variables, the maximum number of cases available may be too small for your actual data.

Probably the nicest feature of Abstat is its input and output of data to disk files. You can choose from Abstat binary files, raw ASCII files or the very convenient dBase II files.

The dBase II interface is particularly well done. Two typical usages come to mind. First, having created an Abstat data file from a raw ASCII file, by simply typing DBWRITE <filename>, Abstat goes away and creates a complete dBase II database

*Australian*  
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COMPUTERWORLD

**SOFTWARE REPORT CARD**

Abstat 3.0

	Poor	Fair	Good	Excellent
<b>Performance</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Documentation</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Ease of Use</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Error Handling</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Hardware required:**

CP/M, CP/M-86 or MS-DOS system.

**Price:** \$400

**Distributor:**

Cycom  
11 Ormond Rd  
Elwood 3184  
(03) 531 3699

file with both your original variable names as dBase field names and all that hard-won data — easy and convenient, the way it's supposed to be.

Second, you may have an enormous database of say epidemiological records of some 30,000 records on smoking and cancer risks. You can use dBase II's powerful facilities to extract a subset of your data (less than 2776 cases!) into a temporary database and then by typing "DBREAD <filename>', Abstat reads the database and sets up an Abstat data structure with the dBase II field names and your data. This marriage of dBase II and a stats package is smooth and logical and allows the stats package to concentrate on statistics.

The ASCII read and write works like a charm and uses Basic 80 comma-delimited fields. Either way, you are guaranteed access to your data before and after Abstat has massaged it.

One final, but important, data manipulation command set is that of

transforming data. The TRANS command allows you to specify a complete equation of the form newvar = f(var1, var2. . . varn) along with up to five conditional statements as to the application of this equation. This powerful feature could be used in the same way that the mainframe log-linear modelling package GLIM uses vectors for mapping and weighting. The SELECT command is a single variable condition global selection facility i.e. SELECT [SEX]=1. It is not possible to have multiple variable condition expressions, but this can be easily achieved using the TRAN mapping function at the cost of an extra variable!

The BUILD, PULL and APPEND commands are well thought out and used to create new variables, add extra variables from an existing file or append new cases to the present data file. The data manipulation commands have at least the same functionality as their SPSS counterparts, albeit on a much smaller data and variable scale.

Until now, I've been full of veiled praise for Abstat; a colleague said recently he was sick of reading software reviews that went on and on glowingly without really canning it! Abstat, at this point, reminds me of any good Hewlett Packard calculator in that it oozes good design and is a pleasure to use. Its documentation is not as voluminous as HP's, but it does the job.

Now the Achilles' heel of all statistics packages — the quality and breadth of the statistics available. Abstat's statistical quality is average and the breadth of statistics is average and shallow. My major gripe about all the packages I've seen on microcomputers so far (save our own and one other) is that you can't have quality and breadth of statistics simultaneously on a microcomputer; there just isn't the memory, disk space and speed to allow it. The basic design philosophy must change from creating a mini SPSS or BMDP on a micro to a package with limited breadth and high-quality statistical procedures. But more on this later.

What will Abstat do statistically? Everything, of course! Well not quite. Here's a list:



**ANOVA** — Simple one way with unequal sample sizes (no major feat);

**ANOVA** — Two way with equal numbers per treatment and no missing values (ho hum).

**Multiple Linear Regression** — produces the basic minimum output (see Figure 2). There is no facility for the extensive analysis of residuals save the raw residuals themselves and the Durban-Watson statistic. The algorithm used is the sums of squares and cross products algorithm; the procedure fails if the correlation matrix is mildly ill-conditioned and produces the inevitable different answers if the data are resorted on any of the regression variables (non-time series) — the standard error of the intercept varied by up to six per cent, the overall F statistic by 10 per cent and the raw regression coefficients by one or two significant digits.

**Correlation matrices** — no frills.

**Spearman's Rank correlation matrix** — no frills.

**Student's T test of mean difference for the population, two samples or a paired sample** — OK.

**Mann-Whitney U** — the non-parametric test on two points of central location.

**Frequencies** — the usual frequency table and Z score output — nice and neat.

**Descriptive statistics** — all the usual expected statistics, but the presentation is clumsy.

**Chi-squared goodness of fit test.**

**Crosstabs** — the usual disappointment; only one variable by another with no provision for going any deeper. The automatic scaling feature for continuous variables is neat and useful for collapsing the data.

**Probability commands** — calculates the lower tail area for five distributions. This command should have been built into their respective statistical procedure — sloppy.

Overall, a motley crew, nothing exciting or innovative. I checked out their number munching speed; Table 1 above is based on three random number generated data sets; Data set A of one variable on 2775 cases, Data set B, two variables, 1386 cases and Data set C, 10 variables on 275 cases.

All the statistical procedures hand-

```

ABSTAT 3.00      Longley Data: Bench test      FILE: LONGLY      REV# 2      3-Feb-84
PAGE 4

COMMAND: REGR

*** MULTIPLE LINEAR REGRESSION ***

DEPENDENT VARIABLE:      7 Y                        16 VALID CASES

COEFF OF DETERMINATION 0.994707      ESTIMATED CONSTANT TERM:      -3.485E+06
MULTIPLE CORR COEFF: 0.997350      STANDARD ERROR OF ESTIMATE:      329.878

ANALYSIS OF VARIANCE FOR THE REGRESSION:

      DEGREES OF      SUM OF      MEAN OF
SOURCE OF VARIANCE      FREEDOM      SQUARES      SQUARES      F TEST
REGRESSION      6      1.840E+08      3.067E+07
RESIDUALS      9      9.793E+05      1.088E+05
TOTAL      15      1.850E+08

CORRELATION

      REGRESSION      STANDARDIZED      WITH
VARIABLE      COEFFICIENT      COEFFICIENT      DEPENDENT
1 x1      15.1195      4.645E-02      0.970899
2 x2      -3.592E-02      -1.01672      0.983552
3 x3      -2.02187      -0.537979      0.502498
4 x4      -1.03379      -0.204851      0.457307
5 x5      -5.096E-02      -0.100952      0.960391
6 YEAR      1830.96      2.48212      0.971330

DURBIN-WATSON =      2.56104

```

Figure 2: Output from multiple linear regression.

Procedure	Data Set	Time (Secs)
SORT	A	203
DESC	A	108
FREQ	A	46
XTAB	B	129
REGR	B	85
REGR	C	216
CORR	C	445
Microcomputer: Otrona Attache, Z80A, 8Mhz, DMA and no Disk I/O.		

Table 1: Comparative processing speeds (in seconds) of various ABSTAT functions.

led missing values very well with the user having at least three options. The regression routine handled a perfect correlation text (variable A regressed on itself) well returning an  $r^2$  of exactly 1.0000 and an intercept of E-7. There is no facility for regression through the origin.

One major problem is the general approach to significant digit reporting — the user has no control over it at all. Also, if a data value or calculated value exceeds E+16, it is set to E+17 — nasty. The numerical accuracy claimed is only six digits; not really enough but, sensibly, numbers smaller than E-16 are set to 0.000.

## SUMMARY

Ergonomically, the Abstat exper-

ience is smooth and pleasant, with no annoying gremlins or inconsistencies. The data handling, especially the dBase II interface, is fantastic. The macro feature is unique and commendable.

Unfortunately, the guts of the package, the statistics, are a poor average, and the numbers of cases limitation is crippling — so near but so far. Abstat is a lot like a Japanese car — it looks flashy, has smooth lines, feels really good but is gutless. If your research problem and budget will fit in a Toyota, this is the package for you. **m**

Bill Fitzgerald is Micro Stat Software, Box 125, Queanbeyan, NSW, 2620. Tel: (062) 97 8305.



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**The Visi On Applications Manager is a major software engineering achievement.**

**John Lombardi reviews the Visi On environment and take a brief look at the Visi On applications.**

# The VISI ON Applications Manager

THE Visi On Applications Manager from VisiCorp offers a completely integrated environment for various applications — including word processing, spreadsheet, database and graphic packages. Although each application program is self-contained, they all share the same information, style and method of operations. Visi On is one of the first of the new generation of programs that combine window management with the integration of tasks.

The advantages of this approach are obvious. You do not need to learn four different sets of complex commands or widely differing program structures in order to accomplish word processing, graphics, spreadsheet or database management tasks. For example, you can instantly insert database information into a written report, convert it to a graph or transfer it to a spreadsheet for further analysis.

This review primarily covers the Visi On Applications Manager (the Visi On operating environment). To test the Applications Manager, we also used Visi On Calc (a spreadsheet) and Visi On Graph (graphics).

The idea of a product such as Visi On is grounded in the exchange of information between various applications. Since we had only two applications to test, we could not explore the product as much as we would have liked.

Visi On is intended for business or professional use, and it demands a substantial investment in equipment. It needs an IBM PC or Honeywell Series 7900 computer with 512K-bytes of memory.

Do not be confused by the manual, which states that 256K-bytes of RAM is all that is needed. The system requirements listed on the Visi On box specify 512K-bytes, and you will need them.

You'll also need a color graphics board, the appropriate graphics monitor, an RS232 serial port, a hard disk containing at least 5M-bytes of memory, a double-sided double-density floppy disk-drive, PC-DOS or MS-DOS 2.0 and the VisiCorp Mouse. When all is said and done, this is not a cheap hardware setup. We tested Visi On on an IBM PC XT.

Visi On requires a special optical mouse, a two-button animal that moves around on a reflective grid measuring 9in x 11in. The mouse connects through the computer's RS232 port and has an umbilical cord that runs to a wallplug transformer that supplies power to the mouse even when the computer is turned off. As long as you don't unplug it, you don't need to recalibrate the mouse.

Like the software on Apple's Lisa and Macintosh, Visi On's basic presentation or analogy (metaphor is preferred in computing jargon) is

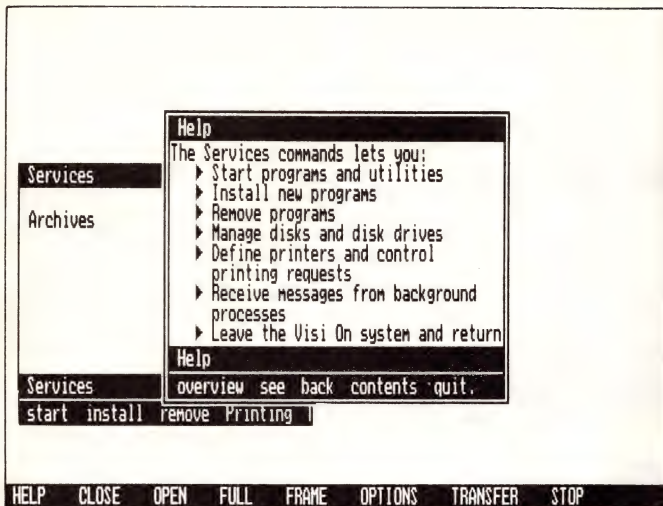
that of a desktop containing papers. By picking up a paper and placing it on the top of the desk, you activate that file — a document, spreadsheet or other piece of work. Visi On stores its files in folders — a continuation of the office-desktop analogy.

Unlike Apple's desktop, however, Visi On does not use icons, or pictures that symbolise files or processes. Instead, Visi On displays menu bars at the top right corner of the screen, each containing the name of one folder. The bottom lines of the screen are devoted to another menu bar, containing a series of options that never varies. They are intuitive selections, such as Open and Close. As you rest the cursor on each option, a fuller definition of the command appears above it.

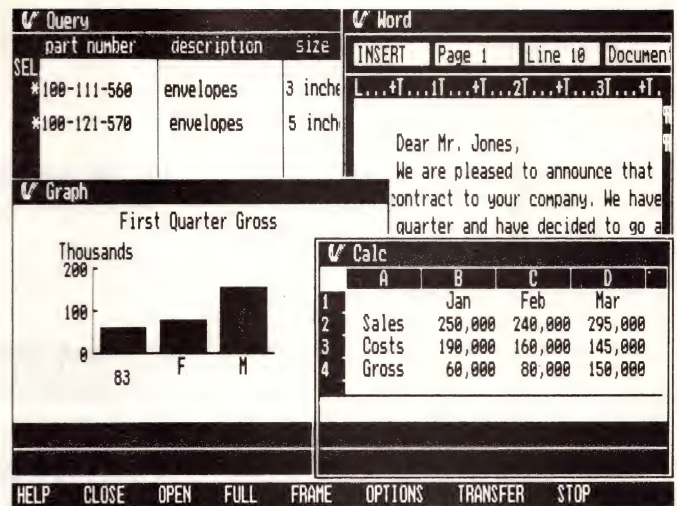
You move between applications by opening and closing windows, the active area of the screen in which you are performing some task. You can define the size of each window and keep more than one visible on your desktop at one time. Each window also displays its own menu bar at the bottom, and you can cause optional menus to appear at the appropriate times by selecting one of the commands in a menu bar.

Because it does not use pictorial representations, the analogy of the desktop is not totally apparent; folders don't actually look like folders. Much of the reason why Visi

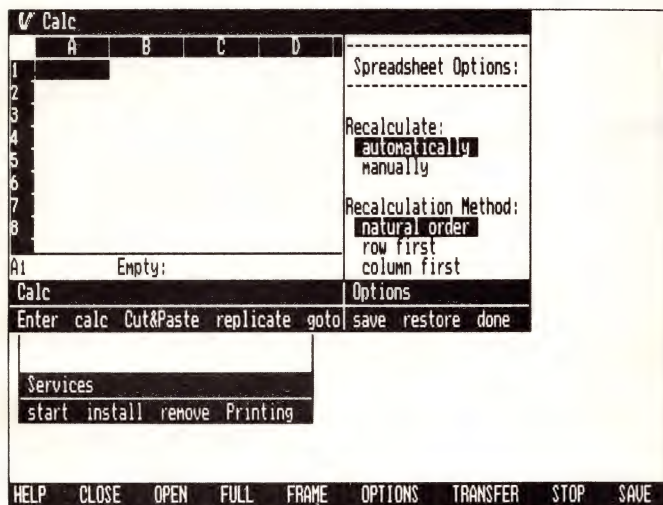




Applications and system utilities are started from the SERVICES window. Selecting the HELP command on the main menu line opens the HELP window with window sensitive help messages.



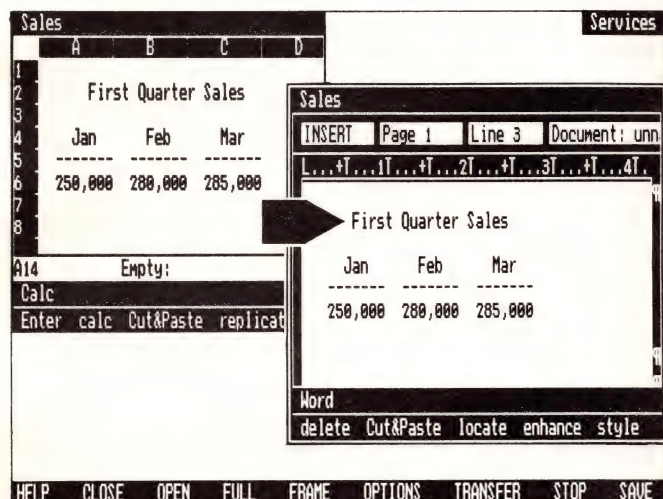
The four Visi On applications. Each application is running in its own window, with the double line around the Visi On Calc window indicating that it is the active window.



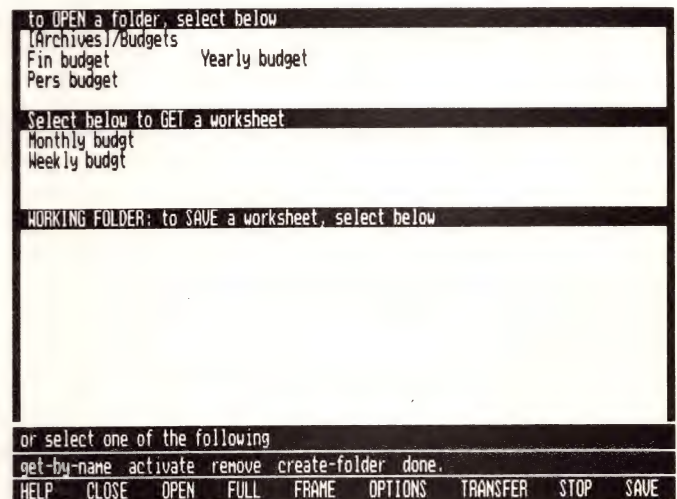
The Visi On Calc window and its option sheet, which enables global parameters to be set. The Calc menu line is scrolled horizontally to reveal all of the items.



The Visi On Word window, set to full screen display, showing the ruler at the top of the page and it's command menu at the bottom.



Data can be transferred between windows by using the TRANSFER command and marking the area around the data to be transferred. Data can be moved between Visi On and other systems using the IMPORT and EXPORT commands.



ARCHIVES selected from the Services window allows file management based on a heirarchical structure of folders and files. A folder can contain other folders or files.



On does not use icons is due to the lack of resolution and processing power inherent in the IBM PC design; if you are used to the Lisa or Macintosh display, Visi On will not measure up.

Visi On, like the Apple products, relies heavily on its mouse. The handheld device performs two distinct functions. It allows you to point at something on the screen by rolling it on the desktop — similar to moving a cursor with arrow keys — and activate the selection by pressing one of the two buttons. By pressing the other button, you can make the material displayed in a window scroll horizontally or vertically.

Moving information between files is as simple as defining the upper-right-hand and lower-left-hand corners of the area you want to transfer, moving the mouse and clicking its buttons.

The Applications Manager makes everything work in Visi On — it handles folders, files, windows and applications. After installing the manager on to your hard disk — it takes up 1.5M-bytes of memory space — you install application programs so they will work in conjunction with it.

But VisiCorp seems to have little interest in helping you handle data that exists outside its own system. According to the manual, an Import function will, in theory, bring DOS files into the Visi On system, but only if you use a special program and DOS to convert these files. Such a program is not available from VisiCorp and can't be run from within Visi On.

The manual does not supply information to help you prepare such a program. The manual does state, however, that third-party vendors will be providing such programs in the future.

Visi On can set up any floppy disks it uses by placing information on them, in addition to whatever information DOS put on the floppy with its Format command. Visi On's nonstandard files do not easily transfer to the outside world. The manager can, however, convert VisiCalc files and export DOS text

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**SOFTWARE REPORT CARD**

**Visi On  
Applications  
Manager**

	Poor	Fair	Good	Excellent
<b>Performance</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Documentation</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Ease of Use</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Error Handling</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

#### Hardware required:

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5M-byte hard disk

#### Price:

\$165  
(Applications Manager)  
\$1499  
(including Calc, Graph  
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#### Distributor:

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files outside its environment.

From the manager you can move to any installed application by pointing the mouse and selecting the application from the menu. The manager then creates a window, names the window, and you may begin work. All work must occur in a window that is open, so if you want to move data from three spreadsheets to a fourth, you need to open windows for all three source sheets and the destination sheet before beginning to work.

Only one window at a time is active, although you can have many open on the screen. When you point the mouse at an open window and press the Select button, that window becomes active and is displayed on top of any other open windows on the screen.

You can adjust the size of windows easily so that pieces of all the open windows are visible. With some practice, it is relatively easy and efficient to activate, deactivate and work among windows.

Visi On Calc and Visi On Graph interact painlessly. Information in the Calc spreadsheet is first moved through an intermediate program called the Graph Series List. Graph then draws the graph with little effort on your part, other than a considerable amount of pointing and selecting with the mouse.

The mouse's pointer moves smoothly and accurately, although you will need some practice to consistently get the pointer where it belongs. If you point and select in quick succession, the mouse cannot always remember your actions because it has no buffer or special areas of memory devoted to it. You must wait for the program to complete one operation before you point and select the next. And of course, you must have a 9in x 11in clear space on your desk for the mouse pad.

We were impressed by Visi On's ingenious method of scrolling. You perform all scrolling with the mouse, whether you are scanning menus or data, by using the Scroll button. You point to what you want to scroll, such as data in a window, press and hold the Scroll button and move the mouse's scroll pointer in the direction you want things on the screen to move.

If you move the mouse's scroll pointer an inch or so you scroll as fast as possible; if you change direction, the scrolling changes direction; if you move and then stay put, scrolling continues until you release the Scroll button.

We tested Visi On Calc and found it powerful and effective on small spreadsheets but unacceptably slow in almost every category with large spreadsheets.

Why so slow? The Visi On manuals contain no technical information about Visi On products. The manager and windows, however, take up a tremendous amount of memory and processing power, leaving not much left over for appli-



cations such as Visi On Calc.

Because it uses the virtual-memory approach of the whole Visi On system, Calc is always reading and writing pieces of large spreadsheets to the hard disk. A spreadsheet recalculation which took 30 seconds using Lotus 1-2-3 took 20 minutes using Visi On Calc.

VisiCorp contends that people have been creating large spreadsheets mostly because they have not had the ability to link smaller ones together easily. They expect that, given Visi On's ability to transport data from window to window, you will develop much smaller spreadsheets than with other products.

On the other hand, Visi On Graph does a superior job of taking data from Calc or entering directly into its own tables and turning them into outstanding graphic images. This graphing program, combined with the window and mouse operation, is superior in flexibility and ease of operation to Lotus 1-2-3. It has a wide variety of graph types and excellent labelling features. The mouse makes moving and placing labels a quick and easy process.

Visi On supports a range of printers and plotters, but it is only satisfactory if your printer is among those chosen for support by VisiCorp.

Visi On's documentation is good.

The tutorials are helpful, the explanations are clear and the manuals readable. Help screens in the programs themselves are useful but are not as good as those in Lotus 1-2-3. The manuals need better indexes and a technical-details section with information about file formats and transfer requirements for those owners who have files to convert.

VisiCorp's copy-protection scheme has a good side and a bad side. The company has devised two types of copy protection, only one of which is now in use. The unavailable scheme, which VisiCorp is still considering for use, relies on providing the mouse with a unique serial number for each system; Visi On's manager compares the mouse's serial number to that of the software.

If you have the serial-number mouse, you can copy all the disks for back-up since the protection is in the mouse. You can only install this mouse on one system at a time, and if the mouse dies, you're out of luck until VisiCorp can get you a new one. You can move the Visi On system as long as you move the mouse. Visi On's system disk is copy-protected.

This disk must be in drive A whenever you start Visi On and whenever you start a new application from within Visi On. When

you begin, Visi On checks this disk. When you start a Calc sheet, Visi On checks the disk; when you begin to Graph, Visi On checks the disk. If the disk is not there, the program does not run.

The manual warns you repeatedly during the installation instructions to be sure you have the right kind of software for your mouse; if you install incompatible software and mouse, you could end up with a corrupt diskette.

With the copy-protected system disk, you can move the system as long as you move the Applications Manager disk. You cannot copy this disk, and you get only ONE system disk.

The parts of Visi On we evaluated — the Applications Manager, Calc and Graph — have superior visual design, good ease of use, excellent graphing capabilities and strong spreadsheet capabilities. The manager is a strong product, and we think it could easily become a great success in the market place.

But it is a large product, and its design makes the use of large spreadsheets impractical. We think the lack of available "import" routines is also a factor against the product. Still, in our evaluation of Visi On's manager as an environment in which to work, we are pleased and impressed.

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## REVIEW

### CHAIRMAN DAN FYLSTRA DISCUSSES VISICORP STRATEGY AND OBJECTIVES

VisiCorp chairman Dan Fylstra has experienced few setbacks in his young career. His first venture in the microcomputer software industry was Personal Software Inc, which he co-founded with Peter Jennings in 1978 in Boston. That year, while working on his MBA at Harvard Business School, Fylstra met classmate Dan Bricklin, who envisioned a program that would carry out calculations similar to a financial spreadsheet.

That program, to which Fylstra's company gained exclusive marketing rights, became VisiCalc. In mid-1979, the company relocated to Sunnyvale, California, where it began marketing VisiCalc. In February 1982 the company changed its name to VisiCorp to more closely associate itself with VisiCalc and the other Visi products.

VisiCorp announced its Visi On operating environment in November 1982. Visi On, Fylstra acknowledges, is a product the company "has placed a lot of bets on".

**AMC:** With the late arrival of Visi On, the dramatic price reduction of the Applications Manager portion of the program only five weeks after it was delivered to dealers, and now with the prospect of a court fight over your best-selling product, there has been much speculation over the company's financial state. What kind of financial shape is the company in?

**Fylstra:** First of all, the company is in excellent financial shape. We have a very strong balance sheet, very strong backers, and we have no debt. We have always had excellent cost controls. We had just shy of an all-time record month in December. The company's financial position is very, very good.

The price reduction on the Visi On Applications Manager was motivated by our very favorable



VisiCorp chairman Daniel Fylstra.

experience with the draw of the Applications Manager for our applications over the first few months combined with our expectation that, while we have the only window manager integrated office workstation software system today, that won't remain true forever. It could remain true from three to five months up to a year, but in any case we have a limited window of time in which to entrench Visi On; to entrench our position. Part of doing that is to get the deepest penetration, the most widespread proliferation of the base system — the Applications Manager — as possible.

The mathematics of it work out very simply; we only have to sell a fairly small incremental number of Visi On Applications Managers, which draw through the additional applications which will more than make up for the margin reduction on



the Applications Manager itself. It is a classic razor/razor blade strategy: our objective is to proliferate the razors because we have the blades available. We are basically an applications company that makes our money on the blades.

The dispute over VisiCalc dates back to the whole period over the past 18 to 24 months when we, at VisiCorp, have experienced delays in the availability of VisiCalc Advanced Version that finally led us to filing the original action in court. Regarding the other issues, I don't have much more to say except that it is in litigation and [discussion about it] belongs to the courtroom.

**AMC:** How dependent are you on VisiCalc? It has always been a big money maker for VisiCorp, but over the past three to six months, how important has that turnover been?

**Fylstra:** We have four basic product sources of revenues. The Visi On family yields both OEM and retail revenues for the Applications Manager, the applications such as Visi On Calc, Visi On Graph, the software tool kit, and a number of other things. Then we have the whole Visi series of products, which include VisiCalc, VisiWord, VisiFile, VisiSchedule — all of which collectively generate a fair amount of turnover. Then we have a business area called communications solutions [a joint venture with software developer Informatics General Corp] which generates turnover from communications software, specifically SNA software, that enable a microcomputer or intelligent terminal to tie into large IBM networks using SNA protocols.

The fourth area, called service marketing, includes VisiPress book publishing activity, our VisiTutor packages, which are diskette-based training aids, and a couple of other training and support-related activities. All of these things generate turnover for us. VisiCalc has been a successful product, and we view it as important . . . but it is just one of the business areas in which we participate.

**AMC:** Can you talk about some of

the problems that forced a delay in the introduction of Visi On?

**Fylstra:** In our view, the development and implementation of Visi On progressed remarkably well considering the magnitude of the undertaking. I would compare it to the magnitude of the effort to build the Apple Lisa or Xerox Star, each of which took a number of years and tens of millions of dollars to develop. Reviewing the whole project, I think we were remarkably efficient and effective at it.

What we said at Comdex/Winter at the end of 1982 was that we were showing this technology and we expected it to become a product we would make available in late summer. To us that meant by the end of September. In retrospect, we could have communicated that more clearly.

For whatever reason, whether it was competitors, observers, industry pundits, or whatever, people had formed their own ideas about when it was going to be available. We came to market within 2½ months of that target, which, for a three-year, \$US10 million project, we thought was pretty good.

**AMC:** What were the product's technical influences?

**Fylstra:** It was inspired in part by the work by Xerox on Alto. We actually started before the Xerox Star was announced and long before the Lisa was announced. We drew on all the accumulated experience we had in creating applications and in building Visi On Applications Manager. We certainly got a lot of inspiration from two individuals, Scott Warren and Dennis Abbey, who have a company called Rosetta. They were consultants to us through the design process and remain so.

Now we have this technology available to us, and it works like we said it would. That is, we are really able to bring up Visi On on a new machine in a very short period of time. All the applications will be available at once without additional efforts, and the leverage for that is really enormous and valuable to us.

**AMC:** Do you have a rough estimate of how many Visi On packages you have shipped so far?

**Fylstra:** The only number I can give you is that when we were about to begin shipping the product, we had a backlog of 30,000 units.

**AMC:** Who are the potential competitors for Visi On? Is Microsoft's MS-Windows one?

**Fylstra:** In our view, MS-Windows is not a serious competitor for Visi On. It has much less ambitious aims in terms of the level of capability or functionality, in our view. And it is not clear that MS-Windows will come with any applications. Visi On provides a lot more high-level services to the applications. There are various window managers that have been announced and in some cases advertised and promoted, but we don't know of anything that is shipping in volume. We have the only one that is real.

If I can make a general comment here: by introducing Visi On at Comdex/Winter, we touched off an incredible amount of discussion on windows, mice, graphics, and operating environments over the past year. In fact, I think that, within the industry, some people view Visi On as having been around for a year now. But in reality, at the customer level, most people who walk into a computer store still haven't heard of windows or a mouse or bit-mapped graphics; they are still trying to figure out what a computer is.

So in many ways Visi On is late, but in many ways it is a few months early. I think the emergence of other products that use this kind of technology, Macintosh for example, will increase people's awareness of what a graphics display is good for and what a mouse is. I think other products will increase people's inclination to buy one. I think it is inevitable and inexorable that customers, as soon as they use one of these systems and experience the advantages, won't want to go back. We have placed some bets on that and are pretty confident those bets will pay off.

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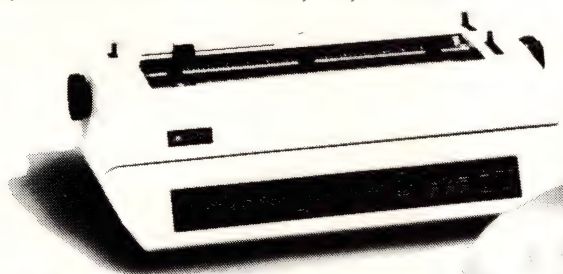
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**Management of simple databases does not require an extensive programming background. Mike Jones and Neville Angove review MicroPro's data management solution, InfoStar**

# DataStar + ReportStar = INFOSTAR

THERE is some argument about which tasks are best handled by microcomputers, but the three which are generally acknowledged as the most important are financial modelling with spreadsheets, word processing and database management. As disk capacities increase and the cost of disk storage falls, database management is assuming a higher profile.

These three tasks, while distinct, are still related in the business environment. Although integrated systems such as Lotus 1-2-3, Visi On and Windows are beginning now to provide the necessary cohesion among different information massaging processes, some data interchange has been possible ever since VisiCalc introduced the data interchange format (DIF) file concept. The submerging of mechanical, primitive operating systems under smooth "operating environments" — with mice for non-typists — represents the current extent of integration and simplification of the main microcomputer processing tasks.

There are as yet no mice in the MicroPro barn, but the high degree of integration between WordStar, CalcStar and the long-time data entry system DataStar has been obvious for some years; DataStar has now been incorporated into a

data management system, InfoStar.

InfoStar is not a language, and no programming skills are necessary to develop a sophisticated database. It is a simple relational database management system that will allow an experienced user to develop a complex data structure from a simple beginning.

InfoStar is really a combination of six main programs plus utilities: Formgen is used to "paint" a data entry form on the screen, defining the allowable contents of each field; the original DataStar program is used for data entry and extraction, as well as creating the index; Rgen is used to create a "quick report" for certain applications; Redit is similar to Formgen, but is used for creating an output report format related to the fields created with Formgen; and Report runs the reports created by Rgen and Redit, providing several levels of error reporting.

### FILE STRUCTURE

InfoStar automatically generates ASCII datafiles that are structured as comma-delimited fields within records. Records are delimited by a carriage-return/linefeed character; the standard sequential file structure of CP/M and MS-DOS. The files can be accessed by Fortran. Basic and Cobol programs can be edited with WordStar and can be used by

MailMerge. Trailing blanks and empty fields are removed from the variable length records to conserve space before they are written to disk, in contrast to the fixed length of fields and records used by dBase II.

InfoStar uses a modified index sequential access method with a compound key of up to 120 characters. A separate index file, with forward and reverse chaining, allows access by key to any record in the datafile in one to two seconds. The theoretical limits to a record are 245 fields, or 4K-bytes, with 255 characters maximum per field.

The key to InfoStar's fast access speed is its use of a little-known feature of CP/M and MS-DOS: the ability to address individual records in a sequential file. Both operating systems provide this feature, but InfoStar is the only major package that makes use of it. As a result, it can give the user the benefits of compact sequential file storage with the speed of random access to files.

The maximum size of a record really depends on the complexity of the data entry form; verifications against lists and calculations of field contents make greater demands on memory, which limits the record size.

### FORM GENERATION

Formgen is used to create the



LIN = 000 COL = 000

CURSOR: ^A = left item ^S = left char ^D = right char ^F = right item  
 ^E = up line ^X = down line ^U = set/clear tab ^I = tab  
 DELETE: DEL = char left ^G = char right ^T = entire column ^Y = entire line  
 INSERT: ^P = line buffer ^V = char right ^B = entire column ^N = entire line  
 OTHER: ^J = rotate help ^W = list form ^C = form done ^K = toggle key

HELP SCREEN 3

Order #: ..... Date (M/D/Y): J.J.J. Customer #: .....

Bill to: ..... Ship to: .....  
 Address: ..... Address: .....  
 City: ..... City: .....  
 State: ..... Zipcode: ..... State: ..... Zipcode: .....

P. O. #: ..... Ship via: ..... Terms: .....

Quantity	Product	Description	Unit Cost	Total Cost
---	---	-----	-----	-----
---	---	-----	-----	-----

Tax rate: ...% Sales tax: ..... Total: .....

Formgen help screen showing cursor control commands and a completed form.

screen template into which information is entered. The template contains descriptive background text that is not stored with the data, such as the names of fields and instructions to the operator, as well as containing the rules which govern the use of each field in the form.

With Formgen, the form designer places field names and attributes, headings and other text on to the

screen. Forms may exceed the dimensions of the screen, although DataStar will redraw the screen during data entry, making the use of very long or very wide forms quite tedious. The form size is limited to 255 lines and 255 columns, if memory does not run out first.

Cursor motion is controlled with the same commands as used in WordStar, although the IBM PC

version also uses the cursor control and function keys. The command options and help messages are displayed across the top of the screen, and the user can choose between different help levels.

Fields are defined by an continuous sequence of underline characters, with one underline per character. A field cannot extend from one line to another, nor can it be broken. At least one field must be specified as a key field for indexing, and the maximum total of key field characters is 120. The shorter the keyfield, the faster an indexed search.

After fields are defined, each is assigned attributes. Each field is automatically numbered according to its position on the screen, but the order of data entry can be changed from this default. Other attributes include naming of fields, restriction of entered data to certain characters, automatic inclusion of constants, justification and padding, formatting, deriving contents from other fields or files, and performing calculations.

The options available to Formgen are numerous, and the range of possible forms is limited only to what can be displayed on the screen. For simple applications, less stringent requirements can be applied to the form definition process.

## DATA ENTRY

The data entry process of InfoStar seems mundane in comparison with the form generation process, but DataStar's ability to pull in information from other files can be quite dramatic (it is unfortunate that it can be used effectively in only few situations).

The screen has a similar layout to that of Formgen, but with two sets of command options. The first selects the mode of operation: add records, select by key, exit the form, scan file in index order, scan file in data entry order, edit the scan mask, select a batch file, file maintenance, verify the batch file, and help.

The second set of commands controls the cursor movement, and also allows additional commands for moving through the data file.

SCAN MODE (I) current form = EXAMPLE

CURSOR: ^A = prev field ^S = left char ^D = right char ^F = next field  
 ^T = first field ^L = last field  
 FIELD EDIT: ^G = delete char ^V = insert hole ^C = Copy from previous record  
 OTHER: ^Z = restore screen ^U = print form ^O = print data ^J = help on/off  
 END/EXIT: ^B = end entry ^N = next record ^P = prev record ^E = exit mode

Order #: ..... Date (M/D/Y): J.J.J. Customer #: .....

Bill to: ..... Ship to: .....  
 Address: ..... Address: .....  
 City: ..... City: .....  
 State: ..... Zipcode: ..... State: ..... Zipcode: .....

P. O. #: ..... Ship via: ..... Terms: .....

Quantity	Product	Description	Unit Cost	Total Cost
---	---	-----	-----	-----
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DataStar screen shows cursor control commands used to modify data in scan mode.



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Please allow up to 21 days for delivery.



DataStar then give the user the option of filing the record or deleting it.

Deleted records are not automatically removed from the file. They are marked in the data file and dropped from the chain in the index file. Modified records are similarly marked (since records cannot be inserted into a sequential file except at the end of the file) and the updated record is written to the end of the file (and indexed accordingly).

The file maintenance procedure is used to remove deleted records from the file. The index file is rewritten to remove out-of-sequence entries and then is used to control the rewriting of the data file in index order. This process can be slow, taking about 40 minutes for a file of 1000 records on a system with 256K-bytes of RAM. An unmaintained file grows every time a record is modified, and the index file becomes less efficient, so file maintenance must be carried out regularly.

The batch file data entry mode provides preliminary storage of data before merging it with the database. It is particularly useful in high-volume data entry situations where record-by-record verification slows expert data entry operators. Data may also be entered to a temporary file on another micro to be combined with the database at a later time.

## REPORT GENERATION

InfoStar differs from the old DataStar package in the addition of report generating programs packaged under the collective name of ReportStar. While it is possible to list individual records in the data entry format with DataStar, this cannot take the place of a proper report format.

There are three reporting programs in ReportStar; Rgen, used for generating quick reports; Redit, which functions like Formgen to create a customised report format; and Report, which runs/prints the reports created by the other two programs.

Rgen defaults to a simple report layout. The user is prompted to select fields from the form definition

	LIN = ###	COL = CTL	HELP SCREEN C
CURSOR:	^E = up line	^S = left char	^D = right char
PRINTCNTL:	SPACE = always print	P = once/page	R = once/report
	1-9 = print at control break n		
OTHER:	^J = rotate help	^W = list form	^C = form done
			^X = down line
			^ = summaries only
			* = user defined
			^O = toggle ^ char

**ReportStar Redit screen with report print formatting commands and sample report.**

file created by Formgen and these are run across the page with column headers that are the field names. Printing characteristics such as boldface for headers and a data field are automatically provided, and there are options for producing totals, averages and ranges for each column, as well as a record count by page or report.

Rgen provides a sound base for developing a more complex report specification using Redit, which can also be used to build a report from scratch. Redit is a complex program, similar to Formgen in many respects, but offering more power and flexibility while still seeming to be incomplete. But the documentation gives the game away. MicroPro has left sufficient room in the numbering of current Redit procedures to triple the number of functions provided by Redit.

The fields the user paints on the screen form the basis for the printed report. Intermediate fields that will not be printed can be used to hold data that is needed for calculations of values to go into other fields, and a complex Then-Unless procedure is available to select which values from the data file will be entered into the report.

The reports fields can be given similar formatting attributes to those

allowed by Formgen, and the contents can be drawn from other DataStar files or from operator entry when the report is run. The whole report can be formatted similarly to a WordStar file, with text mixed with data and using the same print format commands.

Redit also allows the creation of a report format that does not produce a printed report but transfers data from one DataStar file to another of a different format, or merges several DataStar files, or breaks up a large DataStar file into several smaller files. Redit also allows the files that it accesses to be broken into different volumes that may also be on different disks (since DataStar cannot create multiple-volume or multiple-disk files, the source of these files is a mystery).

The Report program controls the running of the report formats, accessing files, reporting of error conditions, and displaying any operator prompts that are required. The user can specify which types of errors are to be reported, and whether the program should stop when such errors are encountered. There are 20 numbered run-time error conditions, and seven others related to faulty report construction.

An interesting addition to ReportStar is the FormSort program, a





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derivation of the Supersort program originally designed for Z80 micros. Basically, this program allows the user to create a new version of his data file indexed against a different key field. The form definition file is copied under a new name, and a different key field selected in the new form definition, and a new index file and new data file created for those occasions where access to the file under a different key is required.

Formsort can be used also to replace the file maintenance procedure of DataStar — a practice recommended by MicroPro in the users' manual since, in this role, Formsort is nearly 10 times as fast as the old maintenance program.

## DOCUMENTATION

The InfoStar documentation is provided as three A5 (approximately) typeset looseleaf manuals, weighing more than two kilograms. The style is readable, accurate, well cross-referenced and comprehensive. It is profusely illustrated with diagrams of the various screen displays and even contains maps to guide the user through the various steps for form and report generation and data entry.

The DataStar manual is in two sections: a step-by-step tutorial demonstrating form design and data entry using typical applications, and an alphabetical reference guide covering all the features and functions in the package. The flow of the tutorial guide is logical, with terms and concepts clearly pre-defined.

The ReportStar documentation is in two manuals: a step-by-step tutorial in the use of the quick report program, and a comprehensive reference guide which lists the descriptions of each function and procedure as a user would encounter them when running ReportStar. Neither manual is as clear as the DataStar manual, no doubt partly due to the complexity of the report generation programs and partly due to the first release state of the ReportStar option.

There is not an overabundance of information in the manuals, in spite of their size. In fact, the document-

ation could be accused of being too tightly written. The acid test is the degree of assistance offered to users when an error occurs, and comprehensive help screens are always available with InfoStar.

## INSTALLATION

InfoStar is widely supported by computers running the CP/M family of operating systems, and the IBM PC XT running PC-DOS. Automatic installation of terminals includes ADM, ADDS, Hazeltine, Soroc

	Poor	Fair	Good	Excellent
Performance	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Documentation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ease of Use	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Error Handling	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

### Hardware required:

Most systems supporting CP/M or CP/M-86.

Price: \$666.

### Distributor:

Imagineering, 3/579 Harris St, Ultimo NSW 2007.

IQ120, Apple II, TeleVideo, Visual 200, TRS-80/Lifeboat and DEC VT-100. Detailed information is provided for installation of other terminals with at least 23 lines by 80 columns and cursor positioning.

DataStar was originally written for 8-bit 48K-byte systems, although a more viable lower limit would be 64K-bytes. The form design program Formgen occupies 35K-bytes, and the smaller memory may limit the degree of complexity of form design.

InfoStar will operate on low-capacity diskettes such as the Osborne 1's 90K-bytes, but encourages more significant databases on formats like 320K/512K/1M-byte floppies. There is a substantial benefit in using hard disk drives. InfoStar works well with Davong's Multi-OS and ACE's DPC/OS multi-user CP/M environments. Tallgrass' and Davong's support of cache memory is very useful, as is the Buffer command of PC-DOS.

InfoStar is a single-user database manager, and aspects such as record locking must be handled by the operating system. MP/M is not supported and strange errors result from defiance of this fact, usually associated with misunderstandings about disk space.

Not that InfoStar works perfectly. Screen scrolling on the IBM PC is accompanied by an annoying flicker and, although the flicker is not InfoStar's fault, re-writing the screen for each vertical cursor movement is part of the package's design. Extending the form beyond the length of the screen requires an irksome procedure involving the storage of a blank line in a line buffer then recalling that line to where it is to be positioned on the screen.

## SUMMARY

InfoStar's potential uses are reflected in the sample databases included in the package: products, clients, orders, customers, invoices, staff and payments. But potential users are not limited to small businesses with accounting applications. Research institutions, special interest groups and people with personal computers within large businesses and government bodies will appreciate InfoStar. Any application that could be handled by a card system using a single key is within the scope of InfoStar.

The package is suitable for use by both novice and experienced users, and there is extensive online help which may be shortcut as experience is gained. If the application can be handled by InfoStar, then it is unlikely that any other database system would be either more efficient or easier to use.

**m**



# THE KING IS DEAD . . . LONG LIVE THE KING !!!

The Medfly was unquestionably the King of the Apple workalikes. It did everything the Apple could do and then more. And it was cheaper!

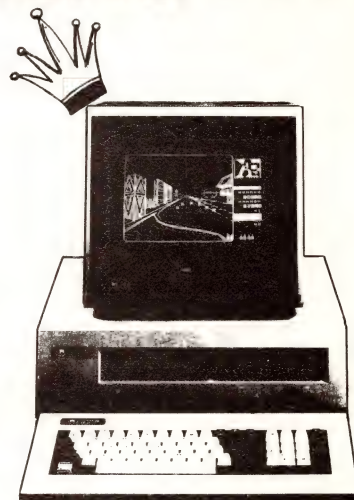
## NOW THERE IS THE LINGO 128

- It does all the same things as the Medfly and then more.
- It is even cheaper than the Medfly.
- It is even better quality.

Check the specifications on the basic machine. Make up your own mind.

	Lingo	Medfly	Apple //e
Twin processor	Y	Y	Extra
Resident basic	Y	Optional	Y
Standard memory	128K	64K	64K
Built-in whisper quiet drives	Internal	External	External
Software selectable 80/40 column	Y	Y	Optional
Hardware selectable 80/40 column	Y	N	N
Centronics port	Y	Y	Optional
RS232/C port	Y	Y	Optional
Composite B/W video	Y	Y	Y
Composite PAL/NTSC	Y	Y	Optional
TV UHF output	Y	Y	Optional
RGB color output	Y	Y	Optional
6 Apple compatible slots	Y	Y	Y
Upper/lower case	Y	Y	Y
Numeric pad	Y	Y	N
Auto repeat keys	Y	Y	Y
Cursor control pad	Y	Y	Y
Function keys	Y	Y	N
Front on/off switch	Y	N	N
Japanese made	Y	N	N
External joystick port	Y	N	N
Voice synthesiser included	Y	Optional	N

Price  
**\$1950**



Cost of Medfly with 128K memory  
and two external drives **\$1860**  
Additional ROM's to bring to  
same level as Lingo **\$140**  
**\$2000**

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# Computer84

1984 International  
Micro Computer Exhibition  
and Conference.

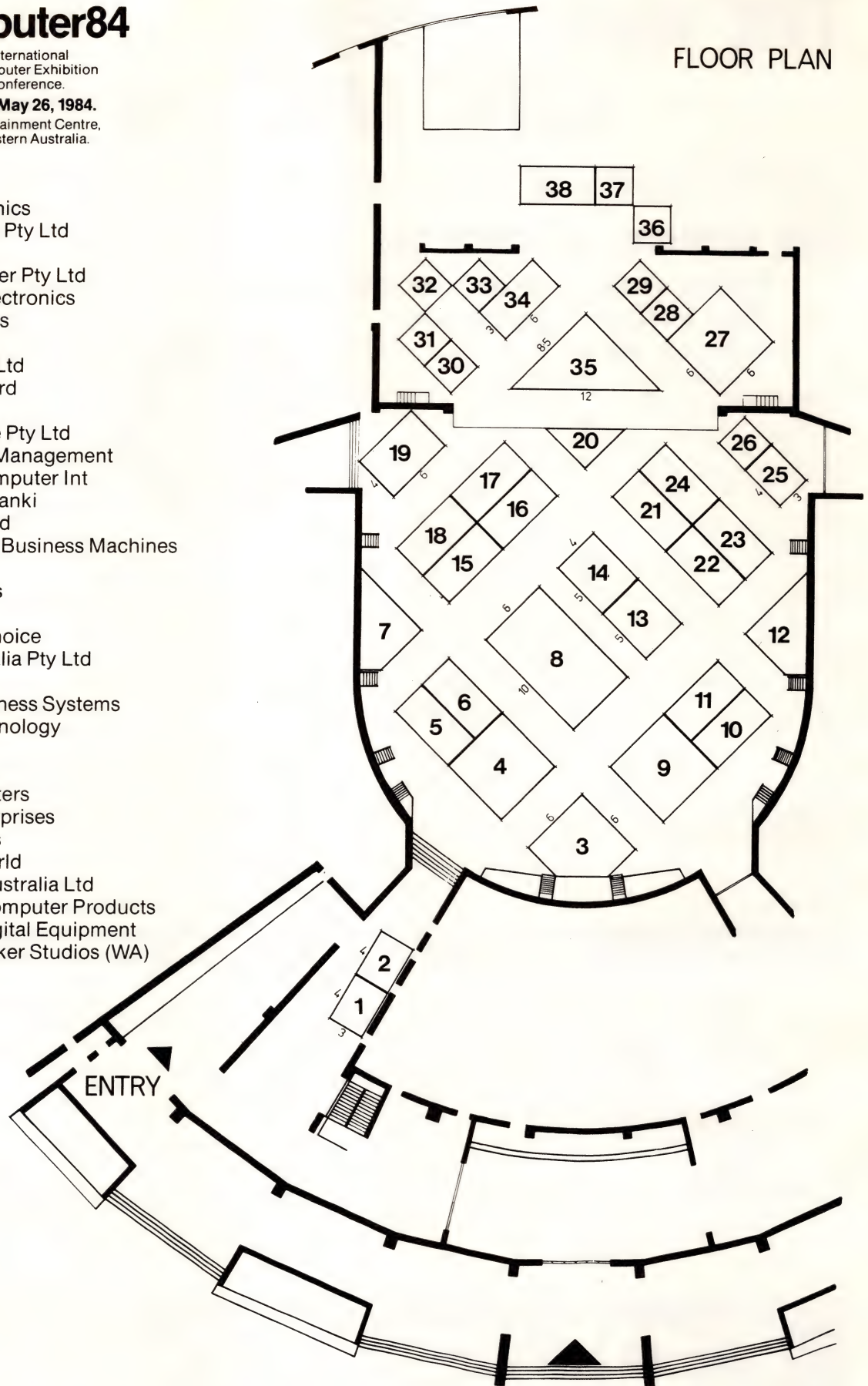
**May 23 - May 26, 1984.**

Perth Entertainment Centre,  
Perth, Western Australia.

## FLOOR PLAN

### EXHIBITORS:

1. Tandy Electronics
2. Wordplex Aust Pty Ltd
3. NEC
4. Wang Computer Pty Ltd
5. Dick Smith Electronics
6. James & James
7. Sperry
8. IBM Australia Ltd
9. Hewlett Packard
10. Micro-care
11. Stott & Hoare Pty Ltd
12. TNT Payroll Management
13. Business Computer Int
14. Warburton Franki
15. Computerland
16. Merton Scott Business Machines
17. Co-Worker
18. EDP Supplies
19. Myer
20. Computer Choice
21. Epson Australia Pty Ltd
22. Telecom
24. Peterlor Business Systems
25. Applied Technology
26. Magmedia
27. ICL
28. Boss Computers
29. Graden Enterprises
30. ABA Systems
31. Computerworld
33. Sola Basic Australia Ltd
34. Australian Computer Products
35. Anderson Digital Equipment
36. Shepherd Baker Studios (WA)







## **1984 International Micro Computer Exhibition and Conference.**

**Perth Entertainment Centre,**  
Perth, Western Australia.

**May 23-May 26, 1984.**

Contact the organisers for more  
information.

### **Exhibition Organiser**

#### **Computer Exhibitions International**

Confederation House, 190 Hay Street,  
East Perth, Western Australia. 6000.

Telephone Jenna Ledgerwood  
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### **Conference Organiser**

#### **Western Australian Institute of Technology**

#### **C/-Convention Makers**

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Perth, Western Australia, 6000.

Telephone Ken Rawlings  
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# We Just Want to Have Fun

DESPITE the exposure of computing as a culture in the popular press, little is available to people interested in digging into the culture. Only a handful of books such as Weinberg's *The Psychology of Computer Programming*, Brooks's *The Mythical Man-Month*, Brand's *II Cybernetic Frontiers* and Kidder's *The Soul of a New Machine* have provided an insight into the culture.

All of these books are concerned with the activity of programming. They approach the subject from similar sympathetic positions except where they enter the subculture of the committed programmer, the domain of the hacker.

Hackers are treated with disdain by most of the industry, which cites their contempt for users and uncontrollable devotion to the machine as reasons for their inability to make worthwhile contributions to the computer world. The popular press promotes hackers to the status of folk hero and moralises about the perils of excessive computer use, using hackers as examples of computer abusers. A smaller group regards hackers as necessary evils (who else is going to keep the system going), and to an even smaller group, hackers are modern-day alchemists. The hackers, themselves, just want to have fun.

The term "hacker" has been degraded over the past few years, as any sub-teen with ability and interest in a computer is called a hacker. While these people may exhibit some of the tendencies associated with hacking, usually an obsessive interest in the technology, hacking is much more.

It's a lifestyle, an approach to the technology and a true subculture.

## The Hacker's Dictionary

by G. Steele et al.

Published by: Harper & Row,  
Box 226, Artarmon, NSW 2064.  
Price: \$8.95.

Reviewed by Ian Webster.

Like all subcultures it has a language that expresses common beliefs and communicates shared concerns.

While the hacker subculture is spread all over the world, the heart of the subculture is found in the advanced computer laboratories of US universities. The subculture is about 20 years old, and its concerns have moved with the leading edge of programming technology, having spent most of its years involved in the area of artificial intelligence and creation and exploration of user environments.

The Australian hacking culture is a little different, being Unix orientated, and deprived of 24-hour access to their machines by university administrations.

For those interested in computer culture, this book provides a gentle insight into one of its seminal subcultures, one that is fading away with the availability of computer power to anyone who wants it.

The following definitions give a feel for the hacker subculture.

**BIT DECAY** *noun*: A fanciful theory to explain SOFTWARE ROT, the phenomenon that unused programs or features will eventually stop working even if "nothing has changed". The theory explains that bits decay as if they were radioactive. As time passes, the contents of a file or the code in a program will become increasingly garbled.

**CONNECTOR CONSPIRACY** *noun*: The (perhaps only mythical) tendency of manufacturers (or, by extension, programmers or purveyors of anything) to come up with new products that don't fit together with the old stuff, thereby making you buy either all new stuff or expensive interface devices.

**HACK**: "The word 'hack' doesn't really have 69 different meanings," according to Phil Agre, an MIT hacker. "In fact, 'hack' has only one meaning, an extremely subtle and profound one which defies articulation. Which connotation is implied by a given use of the word depends in similarly profound ways on the

context. Similar remarks apply to a couple of other hacker words, most notably RANDOM."

Hacking might be characterised as "an appropriate application of ingenuity". Whether the result is a quick-and-dirty patchwork job or a carefully crafted work of art, you have to admire the cleverness that went into it.

**HACK ATTACK** *noun*: A period of greatly increased hacking activity. "I've been up for 30 hours; I had a hack attack and finished off that new FEATURE I thought would take two weeks to program."

**MAGIC** *adjective*: As yet unexplained, or too complicated to explain. (Arthur C Clarke once said that any sufficiently advanced technology is indistinguishable from magic.)

**N** (*en*) *noun*: 1. Some large and indeterminate number. "There were N bugs in that crock!"

2. A variable whose value is specified by the current context. For example: when ordering a meal at a restaurant, "N" may refer to however many people there are at the table. From the remark "We'd like to order N wonton soups and a family dinner for N minus one," you can deduce that one person at the table wants to eat only soup, even though you don't know how many people there are.

**REAL WORLD, THE** *noun*: 1. Those institutions at which people might use the word "programming" in the same sentence as "FORTRAN," "COBOL," "RPG," "IBM," and so on.

2. To programmers (especially hackers), the location of non-programmers and activities not related to programming.

**USER** *noun*: 1. Someone doing "real work" with the computer, who uses a computer as a means rather than an end. Someone who pays to use a computer. See REAL USER.

2. A programmer who will believe anything you tell him. One who asks silly questions. See LOSER. **m**



# Believe me, if I can use a microcomputer you can too.

---

## MY NAME IS DAVID DIPROSE.

For some years I was a middle-level executive with an employer's organisation. It was all to do with labour unions and lobbying governments. Nothing to do with computers.

---

## THE BIG STEP.

Then I decided to strike out on my own. I opened a bookshop. I wasn't a complete novice. My family had been in bookselling for a long time. It dated back to Diprose's Steam Press in London, more than 100 years ago. And that business was nothing to do with computers, either.

---

## THE START OF MY PERSONAL PAPER WAR.

Not long after I started the shop I found my time increasingly taken up with clerical tasks. I realised that the problems of my rapid growth were going to grind me into the ground, if I did not do something about it pretty darn quick.

---

## I HAD TO DO SOMETHING.

That something was the purchase of a computer. The first thing I did was list all my books by coding them. A record of every volume was stored on one floppy disc. The code was recorded when each book was sold.

---

## WHAT A RELIEF.

The benefits were immediate. No more lost sales because of out-of-stock titles. No more expensive re-orders on titles that were selling slowly.

---

## THE SMALL BUSINESSMAN HAS NO IDEA HOW VALUABLE A COMPUTER CAN BE.

My experience with that first micro told me two things. Small businessmen, (without computer knowledge, like I was then) have no idea how valuable a computer can be. And they have no idea how simple it can be to use, if you have the right person showing you how.

I was so impressed I switched my business interest from books to computers. Small business needed to know how computers could help them. And business people needed somebody like me to give them the respect they deserved and the sympathetic instruction they needed.

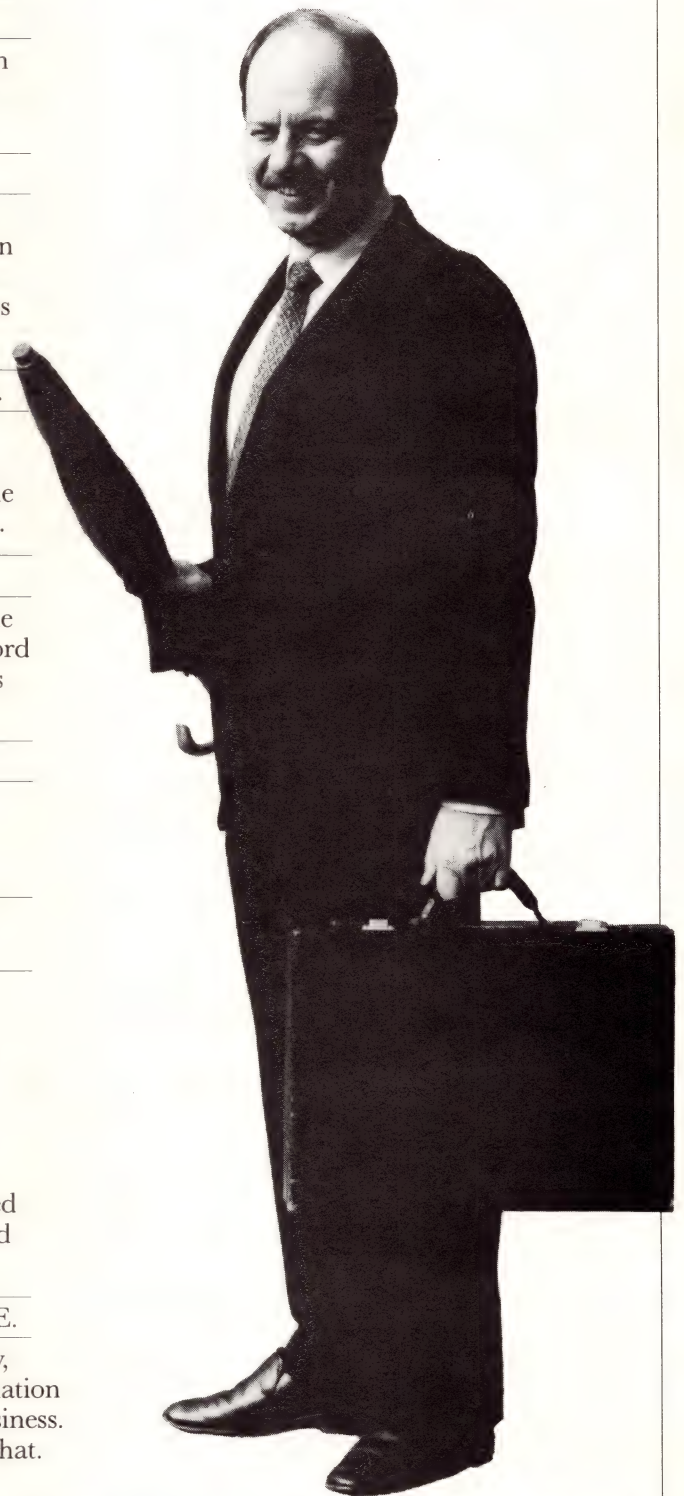
---

## THE HARD PART IS PICKING UP THE PHONE.

Right now I am inviting you to phone me, personally, so that we can set up a time for a discussion and recommendation on how a micro could save you work and money in your business. And don't be put off because you can't use one. I'll remedy that. Because believe me, if I can use a micro, you can too.

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# THE EXECUTIVE™

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The same innovative approach to business computing has created The Executive by Osborne.

The Executive was designed, built and priced with one objective: to increase your productivity. It is a tool to help you move ahead quickly in your business or profession **now**.

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It's the next logical step.

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## Your Osborne Executive is an investment in your business future

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It's an investment in your personal growth, because The Executive gives you new tools to do new jobs, jobs you simply could not imagine doing before.

And it's an investment in your effectiveness, because the Executive handles all the details for accurate computations, error-free typing and organisation of dates, facts and lists.

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## Do you work with words?

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With WordStar,™ The Executive becomes a simple and powerful portable word processor. It lets even two fingered typists get their ideas down faster than handwriting or dictation. Best of all, it is quick and painless to change your mind and improve what you've written, to change your strategy to meet market conditions.

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Letters, memos, reports, articles, copy, ideas – will improve dramatically. They'll take less of your time and minimise interruptions. They'll go out faster. Your time becomes more effective, you become more efficient.

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## Lots of memory to work with

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The Executive has 128K of user memory, making it extremely quick, a useful attribute when you're working with number-oriented tasks or sorting through data files. Expanded memory also lets you add more rows and columns to your spreadsheets than ever before – extending the range and power of the SuperCalc™ program considerably. The two disk drives store 200K each, which means you can have about 60 typed pages of word and number information at your command on a single disk.

---

## Do you work with numbers?

---

The Executive and SuperCalc™ replace your calculator, paper and pencil with the accuracy and unflinching attention of a speedy, dedicated machine.

Remember the last schedule, forecast or budget you did by hand? Now imagine laying it out without having to add any numbers across or down. Think how fast you could work if changes made in one month's allocation were reflected instantly across the entire spreadsheet.

That's what the Executive can do with SuperCalc.™ It works just as easily on a single column of figures, a complex budget forecast, trend analysis or research report.

Everything you do with numbers can be saved on a diskette for later review or revision. Or it can be run out on your office printer.

---

## Do you want to get organised?

---

The Executive includes Personal Pearl!™, a powerful database manager. Using your Executive, you can now file, organise and find all sorts of information. Quickly. Easily. All you do is enter the quotes, name and address lists, market data, or whatever, by filling in simple forms on the screen. Forms you specify yourself.

The Executive will sort it all out and store it in a way that lets you find it the first time you look. Fingertip efficiency that is infallible.

It's a personal electronic filing system, address book and calendar pad all wrapped up in one. You can instantly get your hands on facts that used to be jumbled up in a file somewhere. And you need never again call a phone number that's been changed. Change it once and it's instantly changed everywhere in your own personal database.

---

## Say hello to the information age!

---

The most exciting development in personal business computing is the telephone. The Executive COMM-PAC™ option lets you plug your Executive right into the telephone.\* To let you access and control information electronically. Now you can enjoy instant access to an even wider world of information . . . latest stock listings, news reports, newspaper clipping files, commercial research services . . . the list grows daily.

And you can begin saving time and money with electronic mail. You can exchange files and information with other Osbornes – even other computers – over the telephone lines. Just imagine the advantage of sending a twenty page document anywhere in the world in a matter of minutes!

\*Subject to Telecom approval

---

## Newest and best operating systems

---

The systems that manage computer operations are continually being improved. The Executive includes two different operating systems: CP/M Plus, a new and easier-to-use version of CP/M; and the UCSD p-System, which has recently become an industry standard.



**LIMITED  
OFFER!**

**BY OSBORNE™**



**\$3198**

**By far the best value computer.**

**TAX INCLUDED**

What this means to users is that a vast library of applications tools designed to run with CP/M or p-System computers is available to you. CP/M and p-System software from Osborne and a number of other sources can help you accomplish almost any business task you can imagine.

### **The bottom line**

If quill pens were the state of the art and someone showed you a ballpoint, would you learn how to use one?  
If letter-writing was the way business was done and someone told you about the telephone, would you investigate it?  
If typists and filing cabinets and mounting postage bills are the bane of your bottom line and someone told you about an inexpensive investment that could set you free to do what you do best, would you check it out?

**YES**

**Software worth  
\$3500  
all included in price**

Assessed by Mr Milton McClynn-Worthington  
OSBORNE USER GROUP

### **Do you know the BASICs...**

Two powerful BASIC dialects – MBASIC™ and CBASIC™ come with the Executive. If you have studied a little programming, you'll know the power of these two languages. If you haven't, you may find them useful for business application software and a wide variety of learning programs that will introduce you or your children to the fundamental power of the computer.

### **Terminal Emulation (optional)**

Most large companies have vast stores of information full of facts that would be useful to the executive... if you could only reach them.

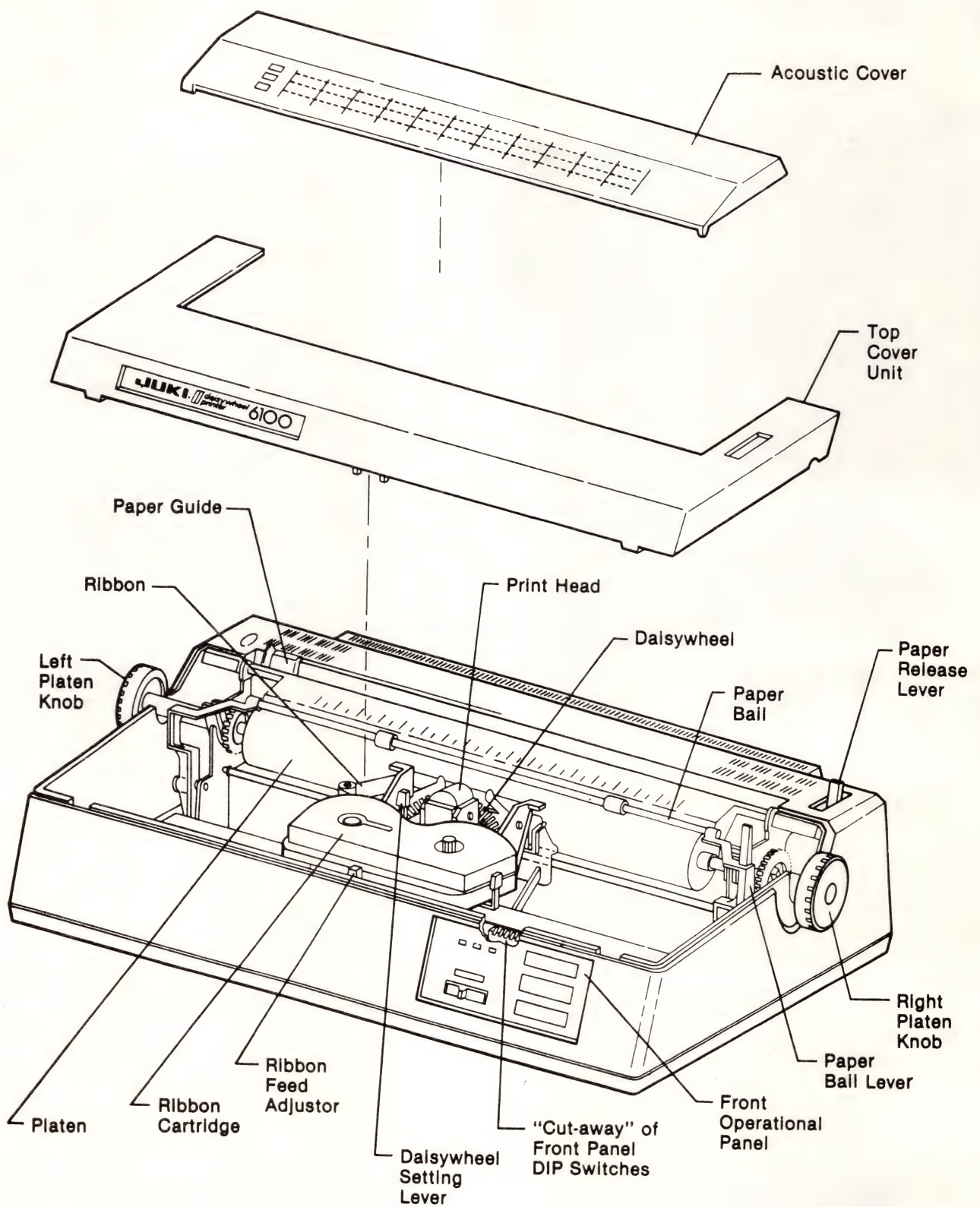
The Osborne Executive lets you plug right into your company's computer system. In many cases your Executive can function with your main computer just like one of its own terminals.

### **Your Executive productivity investment goes where you go**

Because the Executive is portable, you never need to work without it. And you'll quickly find you don't want to work without it.

Enter T016 on Enquiry Card







**Microcomputer users have learnt to live with dot matrix printers, preferring the convenience of fast output to the cost and print quality of the alternative.**

**While daisywheel printers have not developed as quickly as dot matrix printers, the entry of typewriter manufacturers and Japanese print companies into the market has started to produce a range of low cost high-print-quality printers. Neville Angove and Tony Smith survey daisywheel printers costing less than \$1200.**

# CHOOSING A CHEAP DAISYWHEEL

NO MATTER how much you protest about the test from your dot-matrix printer being "good enough for letters", deep in your heart of hearts you know you would prefer that the mail you send out, courtesy of your word processing package, did not advertise its computer printer origins. There is a little of the snob in all of us.

Unfortunately, letter-quality printers used by dedicated word processing systems cost more than the average micro, and even at that price are too slow to replace the quick and dirty output of a dot-matrix printer for

program listings and other large printing jobs.

But just as the prices of micros and dot-matrix printers have fallen, so have the prices of letter-quality printers. The high-throughput versions are still expensive, although inflation has reduced their real prices significantly. In an attempt to capture a larger market, the manufacturers have released lower-quality, lower-throughput models to make it less of a financial strain for some potential users to be introduced to the delights of high-quality computer printing.

Competition being what it is (not forgetting the benefits of mass-production and mass-marketing), the quality and throughput of the lower-price, letter-quality printers has increased while new models with fewer features are introduced at the low end of the price range.

The stage has been reached where a microcomputer owner can now buy a cheap letter-quality printer and a cheap dot-matrix printer for less than the average price of a dot-matrix printer only a year ago.



# DAISYWHEEL CONCEPTS, ORIGINS AND FEATURES

To emulate the quality of typewriter produced material, computer printer designers in the late 1960s naturally reproduced the typewriter and its use of a mechanism that printed a single character at a time. Unfortunately, the most advanced mechanism at this time was the IBM golfball which, apart from requiring a complex mechanism to control it, was also quite slow. More unfortunately, IBM held the patent and was unfriendly towards those manufacturers who wanted to use this design.

The golfball was adopted by some, notably Teletype in its integrated terminal printer, but the high noise of the printer and low quality of the material guaranteed that alternative solutions to the problem would be sought. Instead of putting the characters on a ball, Remington put them on a wheel. The typewheel rotated at right angles to the platen, and was hammered against the ribbon and paper to print the character. It did not work very well, having all the disadvantages of the golfball and no redeeming features.

Some bright spark then decided to rotate the wheel 90 degrees, so that it was parallel to the platen, and put the characters on the side facing the platen with the wheel split to the hub

between the characters so that each letter was on a separate flexible stalk. To type a particular letter, the wheel was spun until the correct stalk was in position, and an electronic hammer forced the stalk against the platen, printing the character.

This design melded the versatility of the golfball to the concept of the typebar, resulting in a simple, light and low-maintenance mechanism. Because the typing element looked somewhat like a daisy, with each petal carrying one character, it was (unsurprisingly) called a "daisy-wheel".

The daisywheel typewriter was not a magnificent success. For starters, the IBM Selectric typewriter was too dominant (and too competitively priced). The fact that the IBM patent lapsed about the same time, making the cheaper golfball design available to everyone, was also a minor difficulty. But the design was there, and the unsuitability of the golfball for reliable high-speed printing was obvious.

The first computer printer manufacturer to adopt the daisywheel in a big way was Diablo. In fact, it has been argued that it was the Diablo daisywheel printer that made word processing an expensive but viable

alternative to the typing pool so beloved by corporate management.

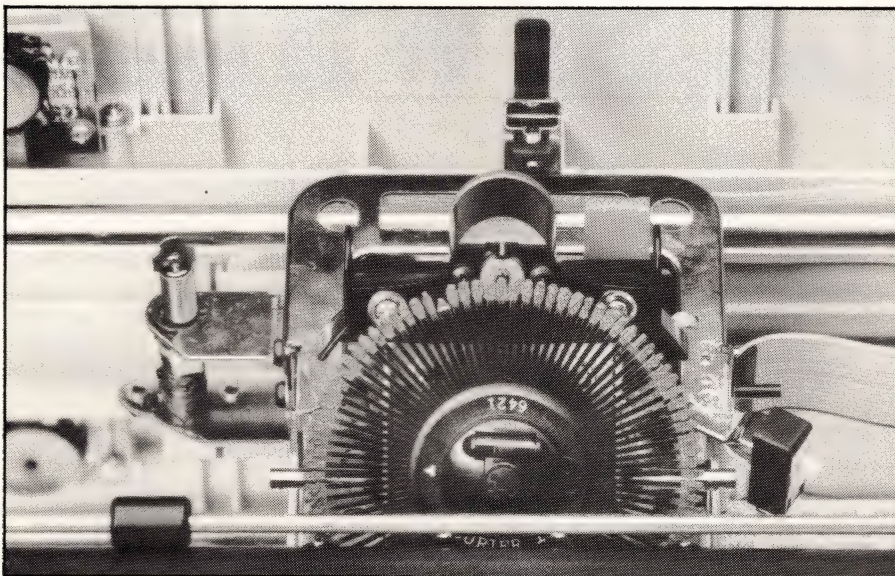
But while the Diablo printer set standards for word processing printing, it did nothing for micro owners still struggling with dot-matrix impact or thermal printers, or fighting with a slow and noisy teletypewriter terminal.

As the demand for word processing — and word processing printers — rose, new, cheaper designs were introduced, such as the Qume and Brother daisywheels and the Nec "thimble" design. The microcomputer boom of 1982-83, with an increasing emphasis on the use of micros as word processing systems, fueled demand for low-cost, letter-quality printers, and the Japanese manufacturers of low-cost electromechanical equipment joined the fray. Today, there are about 20 daisywheel printers available for \$1200 or less for the basic unit, with many offering all the facilities (except throughput) of dedicated word processing printers.

An alternative for micro owners fascinated by the Diablo was to convert a golfball or daisywheel typewriter into a slow printer. Quite apart from the expense of such an undertaking, the resultant printer was not always reliable, since the original typewriter mechanism was not designed for the continuous hammering imposed on it when used as a computer printer. This alternative was effectively no alternative if intended for high-throughput printing.

In Australia, the most common typewriter modification used the IBM Selectric as its basis. Solenoids and link rods, plus a little circuitry, were added to the Selectric, and the lot connected to the computer by a black box, a heavy cable, and some additional hardware in the micro system unit.

ASP Microcomputer, of Melbourne, the Australian distributor of these interfaces, delivered several hundred of the US-designed and manufactured conversions after microcomputing began seven years ago. It



Daisywheel mechanism showing the petal hammer.



claims that most would still be in use somewhere. Conversions are still available for the newer IBM models 50, 60 and 75, with the Selectric 85 interface yet to come.

With few exceptions, low-cost daisywheel printers are priced about \$900, and offer speeds of 18-20 char/sec. Given the range of discounts offered by dealers, and the differing prices of options and cables, the initial purchase price when selecting from this group is of relatively little importance.

A similar, low importance can be given to slight differences in rated speed, since actual throughput depends largely on the type of material printed and the time it takes for the printer to advance the paper to the next line or page. After price and speed have been considered, the user should examine the more mundane operational considerations, such as special features, ease of setup and use, documentation, quality of printing, options (tractor feed and sheet feeders), noise levels, reliability, availability of consumables and paper width allowed.

## PRICE

The price of a daisywheel printer is not always a good indication of its worth. A higher price can mean an earlier design (and price structure) with actually fewer features than a later design at a lower price. Conversely, a low price could mean that a distributor/dealer is receiving larger discounts for buying in bulk, or is willing to accept a lower profit margin, hoping support costs will be low.

## SPEED

Benchtests of several daisywheel printers indicate that the rated speeds of the printers differ significantly from the throughput of "average" text, mainly due to the speed at which the paper is advanced. The printer speed is normally given as a Shannon text rating, for a particular character size. Shannon text is a close approximation to the word size and character frequency of normal English, and the speed at which such text is printed should be an accurate rating of a printer's throughput.

But text throughput in normal use

can be affected by the number of half lines and blank lines (and how the printer logic treats them), the amount of overstriking (for bold or shadowed text), and the speed at which paper is advanced between lines and pages.

## PAPER WIDTH

An important consideration in selecting a low-cost daisywheel printer is the carriage width. While most printers will accept 9in paper, none will accept the 15in continuous paper occasionally required by some software (some accounting software particularly). If you need to use 15in paper, a low-cost daisywheel printer is unsuitable.

## PRINT QUALITY

The quality of printing in a daisywheel printer is rarely dependent on the quality of the printing wheel since, in most cases, the printer uses a wheel from one of the major companies such as Qume, Diablo or Adler. What is important is that the character positioning mechanism holds the wheel steady while the "petal" is struck, otherwise the character printed will be smudged.

It is rare that a user does not require either a tractor feed mechanism for use with continuous stationery, or a sheet-feeder for single-sheet stationery. These items can normally be provided only by the printer manufacturer, and the prices charged can vary considerably. The use of such mechanisms may interfere with access to the printer, for example, for changing the printwheel or ribbon, or in themselves they may be difficult to use or unreliable in operation.

## CONFIGURATION

Because printers are designed with no particular micro or software in mind, they must be set up differently for each particular microcomputer (and sometimes, each word processing package). This mainly involves selecting protocols and communication speeds, adjusting line and character spacings, and occasionally selecting page length and printing mode. It is easier if these adjustments can be made using clearly marked switches on the front panel of the printer, but most printers require the user to

change DIP switch settings inside the printer case.

Most low-cost daisywheel printers claim Qume or Diablo compatibility, meaning that a word processing package can communicate with them using the same character codes used for a Qume or Diablo printer. The fact that a printer uses a Qume daisywheel does not make it Qume-compatible, and any such claims should be thoroughly tested.

## INTERFACE

For several years, most daisywheel printers were manufactured with a serial interface. Now, all except two low-cost daisywheels have a Centronics parallel interface as standard, meaning that only a simple interfacing cable is needed. Most of these printers also incorporate a small buffer which allows background printing with most word processing packages.

## DOCUMENTATION

Probably the major criticism concerning low-cost daisywheel printers is the poor documentation provided by the manufacturer. The instruction manuals vary from the poorly written and incomplete to exceptional reference works that can be understood by any user. But, without a good instruction manual, even an expert can be stymied by an unusual interfacing problem.

## NOISE

Probably the least considered aspect of daisywheel printer performance is noise. The high-pitched whine of the motor and drive belts acts as an annoying counterpoint to the room-shaking thumping of the printing mechanism and can only be tamed by encasing the printer in an acoustic hood (the cost of which effectively doubles the price of the printer).

If you are going to have trouble with any component of your microcomputer system, it will probably be with the printer. Unless you are sure enough of your skills in interfacing and Band-aid repairs, you should buy from a dealer who can give you the service and support you most probably will need.



## POWERTYPE

While the Juki 6100 can be considered the first low-cost daisy-wheel on the Australian market, the Star PowerType must be the latest. The unit tested was a pre-release model, available for demonstration only until stocks become available in late May.

The PowerType (\$780) is a large unit, similar to an office typewriter, with a control panel extending about 2cm forward of the sloping front. The top of the case lifts up to provide access to the ribbon and printwheel, as well as to five slide switches and 20 DIP switches. The control panel has five operation buttons, including one to change the printer's status from word processing mode to Epson printer mode.

The hidden slide switches control form length, linefeed code, character pitch, line spacing and printing pressure. The DIP switches select the parallel or serial interface, the printing mode, whether the printing parameters will be controlled by software or the five operation buttons, the printwheel type, and the serial interface protocol details.

A tractor feed was unavailable for the demonstration, so there was no way to judge if it would interfere with opening the case top, therefore negating the otherwise excellent access to the switches.

The printing mechanism is spring-loaded, but only requires a light touch to angle it backwards to access the daisywheel. This wheel is a standard Qume daisywheel which can be bought from a variety of suppliers. Since it takes considerable effort to unclip the wheel from the printing mechanism, the possi-

bility of damaging it is high. The printer also uses standard Qume ribbons, but the particular type is not given in the manual.

Case does not intend to import a cut sheet feeder for the PowerType, but they may be available from other sources.

The initial setup is easy, although it takes considerable reading of the manual to determine just how little has to be done, especially if you intend to use the PowerType in parallel word processing mode. Having all the switches at the front of the case is a major blessing.

Although rated at 18 char/sec (Shannon text), the PowerType's time on the test document was 345 seconds, or about 14.6 char/sec. A slow slew rate may have been the major cause of this speed degradation.

In operation, the PowerType was quiet, but with a slight, high-pitched whine. Print quality was good (the whole of the print mechanism is standard to several low-cost daisy-wheel printers, meaning that most have the same high-print quality), but was adversely affected by the use of a multi-strike ribbon which caused the occasional void in some characters.

The manual is a version of the standard Star printer manual and most of the technical details needed are included. Unfortunately, even though the manual is adequate for most users, there is not much room in 64 A5 pages for too much detail. Case will provide a new, better written and much larger manual when the printer is released in May.

Case Communications Systems Ltd is at 1-3 Rodborough Rd, Frenchs Forest, NSW 2086. Tel: (02) 452 5231.

## BYTEWRITER

One obvious improvement on the concept of modifying IBM Selectric typewriters to act as computer printers was to design a typewriter to facilitate such modification.

While such a consideration may not have been European electronic giant Olivetti's main concern when designing its Praxis range of electronic typewriters, the Praxis design has an unusual method of incorporating an interface unit which can take parallel or serial computer output. Williams Laboratories of Ithaca, New York, developed the Bytewriter interface which fits inside.

When not receiving computer output, Praxis can be used as a normal electric typewriter without having to disconnect anything or reset any switches. There are several typewriters in the Praxis range.

The bottom of the range is the Praxis 35 at \$799. This is a bare-bones printer rated at 12 char/sec with a 12in carriage. The Praxis 40 is almost identical with the addition of a 13in carriage. The top of the range is the Praxis 45 at \$1170 offering extra function keys and a 16-character LCD display for line corrections.

Olivetti intends to provide its own interfaces at a later date with a slot in the side of the casing for added memory or a computer interface. While the quality of the typewriter is much better at the top of the range, performance as a printer is similar throughout. The machines offer a compromise for people who still need a quality typewriter and want a daisywheel printer.

Computer Edge is a 229 Chapel St, Prahran, Vic 3181. Telephone: (03) 529 7622.

**For Macintosh, this is university & affluent, accessible, and by offering Apple should be able to add university list of dealers (some universities compulsory for students).**



## C.ITOH A-10-30

The latest addition to the C.Itoh A-10 series, the Model-10-30, differs little from its predecessor, the A-10-20, except for a 40 per cent increase in throughput. This printer is actually outside the price range being considered, and is included to show what you must pay for a higher printing speed.

At \$1530 for both the serial and parallel versions, the A-10-30 is about 50 per cent more expensive than the Juki 6100. On the other hand, on our test document it printed at the creditable rate of 21.6 char/sec, about 50 per cent faster than the Juki.

The A-10-30 is a large machine, but not able to take 15in continuous paper. The top of the case lifts off to give clear access to the ribbon and printwheel. The front panel has three toggle switches for setting character pitch (10 or 12 chars/in, or proportional spacing), line feed, form feed, and online/offline. There is no switch to set top of form.

The tractor unit (\$234) and sheet feeder (\$1674) fit easily over the platen, and do not interfere with opening the cover. The daisywheel — a 100-char TEC version compatible with apparently no one else — slips out easily, but only after the ribbon has been removed.

Two innovations by C.Itoh may make life easier for the user: the paper-out and ribbon-out detection systems are optically-based, rather than using a mechanical switch.

The manual is 62 A4 pages, detailed enough to allow interfacing the A-10-30 to almost any computer, but not really written with the novice user in mind, especially if this user needs to modify the interfacing.

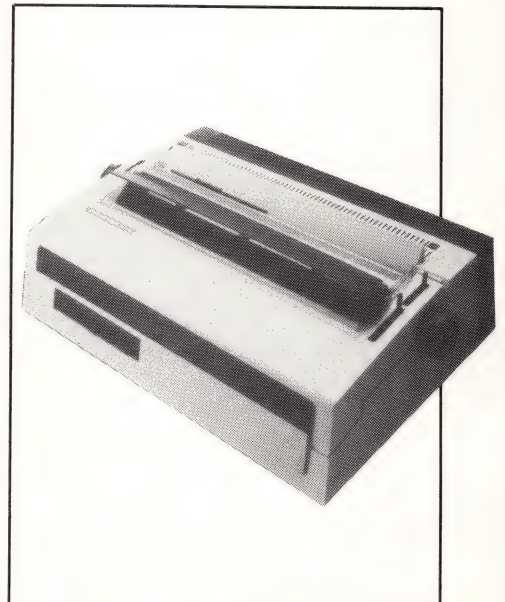
Overall, the A-10-30 represents good value for money (but why no top of form switch?), offering performance equal to that of daisywheel printers nearly twice its price.

Warburton Franki is at 9 Birnie Ave, Lidcombe, NSW 2141. Tel: (02) 647 2266.

## SILVER REED EXP500

The Silver Reed EXP500 was intended to be at the bottom end of the low-cost daisywheel printer range, while still offering most features of its higher-priced relatives. But at \$845, it is not as low as you can go.

The EXP500 is a small unit, about 45cm wide and 30cm deep, with a blocky shape. The top of the case swings back to allow access to the daisywheel and ribbon and 15 DIP switches used to set the printing parameters and protocol details. The front panel has four push-button controls for setting top of form, line feed, form feed, and switching the printer online or offline.



Silver Reed EXP500

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### Printout from the Silver Reed EXP500.

Although the EXP500 allows 10, 12 or 15 char/in spacing, selected by DIP switch or under software control, only a single spacing is allowed except under software control. The printer can also be set to serial or line mode, the latter allowing bi-directional printing.

The tractor feed assembly (\$215) and single sheet feeder (\$450) do not interfere with the opening of the cover for changing the print wheel or ribbon. Even though the daisywheel is claimed to be Qume-compatible, its locking mechanism is unique to Silver Reed. The ribbon cartridge is the Olivetti type.

Initial setup is easy, although the manual does not explain in detail reasons for choosing some of the options, or the tradeoffs involved (for example, serial versus line mode).

Although rated at 14 char/sec (Shannon text), the EXP500 only

managed 7.2 char/sec on the test document, and 10.4 char/sec on a single paragraph without blank lines. The print quality was good, and the noise-level reasonable.

The manual has 28 A4 pages, with detailed diagrams showing how to change ribbons and printwheels, and program listings showing how to access many of the printer's functions from software. Technical details are sparse.

The EXP550 is the bigger brother to the EXP500, retailing for \$1275, with the tractor feed and sheet feed the same price as those for the EXP500. This larger unit offers, in addition to the EXP500's features, a front panel-selectable proportional printing setting, 17 char/sec throughput (not tested by us), and the ability to accept 15in paper.

Pacesetter Peripherals is at 16 Dickson Ave, Artarmon, NSW 2064. Tel: (02) 439 4655.



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## BROTHER HR-15

Brother became well known for the first low-cost electric typewriters, so its entry into the computer printer war became one by which the competition was judged.

Compared with some recent releases, the Brother HR-15 is relatively expensive for its modest speed range, but it still has almost all the features that this class of printers can offer, including a unique \$450 optional keyboard. Other options are serial interface (\$50), tractor feed (\$195.50) and a cut sheet feed (\$479).

While its noise level is not particularly high, the printer's relatively slow clicking could become annoying.

The test on this printer was done from a file already available on a Morrow printer rather than the Kaypro file used to test other printers. Although the printer was set to 10 pitch, the resulting print was microjustified by the WordStar-like word processing program.

The run time of 6 mins 40 secs gave the HR-15 a rating of exactly 12 char/sec, significantly less degradation from the advertised speed (13 char/sec) than for most other printers.

The printer controls, which include a reprint/clear buffer switch, are the best of any printer reviewed.

Some settings on the front panel are set by repeatedly hitting a button to step through the available choices.

The printer will support two color printing and super/subscript functions. Brother uses its own daisywheels, so there is a limited choice of styles.

Brother has not attempted to build a printer version of a typewriter design, like other typewriter companies, but has designed a fully featured printer. The low speed rating lets the printer down with the 32 char/sec-rated Brother HR-25 priced just outside this survey at \$1345.

Brother Industries are at 49 Herbert St, Artarmon 2064. Telephone: (02) 439 7344.

## LOGITEC WP-550

The proprietor of Melbourne's newest computer shop, Ray Pope, has a history of importing inexpensive Asian products, so it is of little surprise that Micro Buff directly imports daisywheel printers for the under-\$1000 market.

The older Logitec WP-550 is positioned unapologetically close to the bottom of the range of such printers but has several features missing in the more expensive models. For the strange price of \$708, Logitec provides both parallel and serial interfaces, friction feed and a modest but effective in-chassis pin feed for continuous stationery — all as standard features.

Logitec took 7 min 45 sec to print the test document, with WordStar configured for a standard printer with backspace. Its rated speed at 10 char/in is only a modest 12 char/sec, making that performance even more noteworthy.

The printer uses Adler 100 character daisywheels, doesn't support superscript and subscript printing and has an adequate 15-page manual.

Apart from being slightly noisier than other printers tested, Logitec stood out for its very fast form feed.

Micro Buff is at 499 High St, Mt Waverley, Vic 3149. Telephone: (03) 277 7754.

## SMITH-CORONA TP-II

The Smith-Corona TP-I was Pacific Typewriters' first serious entry into the computer market and, at its bargain basement price, it was picked up quickly by serious low-cost computer dealers such as the President group. The TP-I quickly sold out in Australia, no doubt helped by President's special deal of bundling it with Kaypros at no extra cost, before the recent Kaypro price drops.

Pacific Typewriter is now bringing in the TP-II but, at the time the bench tests were being done, the first batch of those units had not been released. Smith Corona has done things a little differently to the other printers. The printer uses a 93/char daisywheel, doesn't appear to have any buffer memory, uses rocker switches for paper controls rather than membrane switches and has the DIP switches mounted behind a panel. The Smith Corona is a very cheap (\$595) printer but reflects its typewriter origins.

Pacific Typewriter is at 270 Lonsdale St, Melbourne 3000. Telephone: (03) 663 1444.

**Top: Printout from the Brother HR-15.  
Bottom: Printout from the Logitec WP-550.**

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## JUKI 6100

The Juki 6100 is suggested as being the leader of the new generation of low-cost daisywheel printers, and was one of the first on the Australian market. Of the printers actually tested, it also gave the highest throughput.

The Juki 6100 (\$995) is a large unit, about the size of an office typewriter, with a sharply sloped front. The top of the case lifts off to provide unobstructed access to the ribbon, daisywheel and the 10 DIP switches that specify printing characteristics. The front panel has three membrane switches for pause, reset and form feed, and a four-way switch for selecting character spacing, including proportional spacing.

The switches for protocol selection on the serial interface (\$100) are well hidden and difficult to access.

The tractor feed unit (\$199) fits easily over the platen, but obstructs the removal of the top of the case when you change the ribbon. The daisywheel (an Adler wheel) can be inserted/removed easily, with the flick of a lever, without removing the case top. Of the printers examined, the Juki 6100 had the easiest to remove daisywheel, an important point considering the fragility of these wheels.

A single sheet feeder (\$595) is available, but was not tested. Customised cables (\$72) are provided by the dealer or direct from Mitsui.

Initial setup is easy (apart from setting the serial protocol), with the user needing to specify character spacing, character set, impression level, type of paper, form length, and line spacing. One of the switches is used to select an IBM PC as the host computer!

Although rated at 17 char/sec (Shannon text), the Juki's time on the test document was 325 seconds, or about 15.6 char/sec, which was both the fastest measured throughput and the lowest speed degradation. The Juki has a slow slew rate, and a long settling time after a form feed (when it waits for the next sheet from the sheet feeder), which accounts for this degradation.

The printer seemed quieter than others with the same decibel rating, but movement of the printing mechanism was accompanied by an annoying whine (found on both Jukis tested). The slow slew rate also made paper movement through the tractor feed fairly quiet.

The Juki uses IBM Selectric cartridge ribbons, which are considerably cheaper than the Qume/Diablo ribbons used by other printers. The print was sharp and complete, without smudging or voids.

The Juki 6100 had one feature shared by only a few printers — the ability to print text proportionally independent of software. By setting the pitch selection switch on the front panel to "PS" before turning on the power (and installing a proportional daisywheel), the Juki 6100 acts as if it has received a proportional print command.

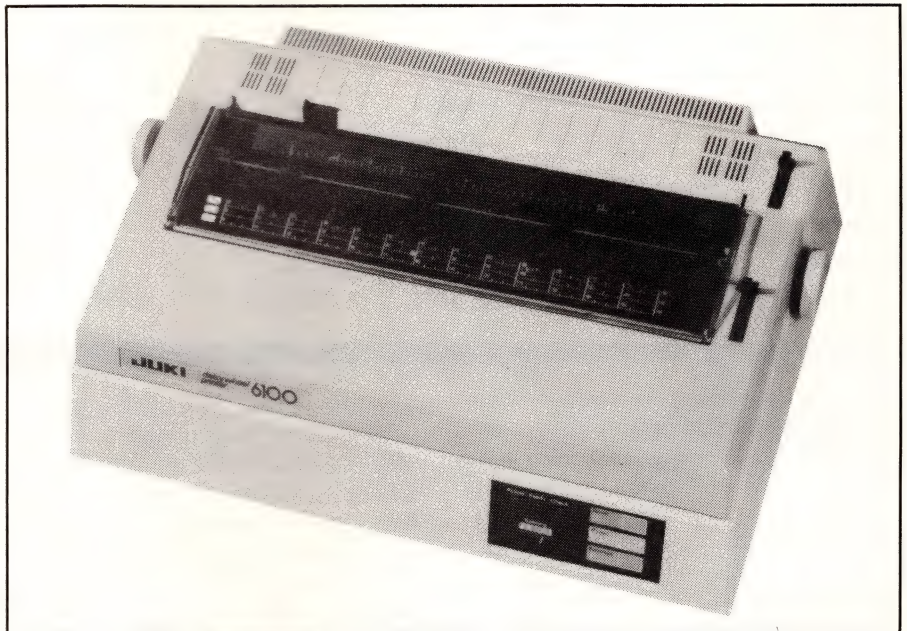
The Juki 6100's documentation

is exemplary. The manual is 164 quarto pages, spiral bound, designed and written in the US. It is by far the best printer documentation ever produced, taking the reader logically and clearly through the printer setup, protocol selection and even cable design.

The manual also provides step-by-step instructions for patching WordStar (and PerfectWriter where relevant) to overcome hardware and software problems on the Apple II, IBM PC, Kaypro and Osborne, to allow full use of Juki features not enabled by the Diablo 630 printer driver.

Even if you do not want to install a printer, this manual is enjoyable to read and generally informative on printer installation problems.

Mitsui Computer Systems Pty Ltd is at 1-3 Rodborough Rd, Frenchs Forest, NSW 2086. Telephone: (02) 451 7711.



Mitsui's Juki 6100.

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Printout from the Juki 6100.



Brand	Letter Writer	Sanyo	Silver Reed		Case	C. Itoh
Model	SP2000	WD100	EXP500	EXP550	Powertype	A-10-30
Price <sup>1</sup>	\$999	\$729	\$845	\$1275	\$780	\$1530
Print speed (CPS)						
claimed <sup>2</sup>	20	18	14	17(s)	18(s)	25(s)
tested	13.1*	13.1*	7.2	—	14.6	21.6
Print width <sup>3</sup>	12	12	10	13.2	11	11.5
Paper width	13	13	10	17	13	13
Daisywheel chars. <sup>4</sup>	96Q	96Q	96P	96P	96Q	100P
Diablo 1610/630 <sup>5</sup>	yes	yes	yes	yes	yes	no
Hor. spacing <sup>6</sup>	10/12/15	10/12/15	10/12/15	10/12/15/PS	10/12/15	10/12/15/PS
increments	1/120	1/120	1/120	1/120	1/120	1/120
bi-directional	yes	yes	yes	yes	yes	yes
Ver. spacing	6/3	6/3	6	6	8/6/4/3	6
increments	1/48	1/48	1/48	1/48	1/48	1/48
bi-directional	yes	yes	yes	yes	yes	yes
Slew (in/sec) <sup>7</sup>	—	—	2.0	4.0	2.0	4.5
Noise (dB)	62	60	65	65	—	62
Power (Watts)	80	80	70	80	80	—
MTBF in hours <sup>8</sup> (duty cycle)	2000 (25%)	2000 (25%)	2000 (25%)	2000 (25%)	—	—
Weight (kg)	9.5	9.5	8.5	14	11.7	15.5
Interface <sup>9</sup>	P,S	P,S	P,S	P,S	P and S	P,S
Features <sup>10</sup>	—	—	—	—	—	—
Options <sup>11</sup>	T,S	T,S	T,S	T,S	T	T,S
Ribbon type <sup>12</sup>	Q	Q	0	0	Q	D
Buffer <sup>13</sup>	256 bytes	256 bytes	2K/8K	2K/8K	—	2K/8K

## SANYO WD100

The Sanyo WD100 daisywheel printer is similar to Uchida's, but manufactured to Sanyo's requirements. The only changes made have been to the case, the manual and to the positioning of the DIP switches.

The most obvious difference between the WD100 (\$729) and the DWX-305 is that the top of the case is hinged near the platen instead of simply being clipped into position. When the top is lifted, the 16 DIP switches used to set the protocol and printing parameters are visible behind the membrane-switch control panel.

The printer is relatively small, about the size of an IBM PC, and

uses the same Qume-compatible printing mechanism used in the DWX-305 and the PowerType. Sanyo has cut the claimed throughput to 18 char/sec, a more realistic figure than the 20 char/sec claimed by other printers using the same mechanism. We were unable to check this speed with our test document, but our observations of the printer in self-test mode indicate a slower throughput than claimed.

The WD100 is available in both serial and parallel versions, at the same price (strange, but true according to Sanyo). A bi-directional tractor costs \$169, and a sheet feeder will be available in future for about \$1000. If they follow the DWX-305 design, they will not interfere with opening the top of the case to

change printwheels or the ribbon.

Sanyo Office Machines Pty Ltd is at 127 Walker St, Nth Sydney, NSW 2060. Tel: (02) 929 4644.

## UCHIDA DWX-305

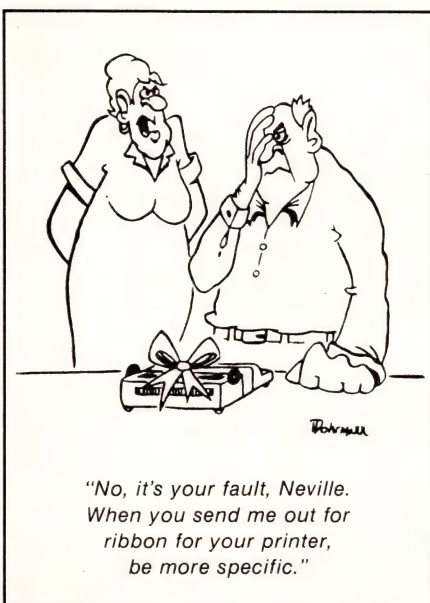
Another offering from Micro Buff is a slightly more impressive unit, which arrived in the country during our test week. Powermatic Data Systems of Japan's Uchida DWX-305 looked impressive, especially as it is to be sold bundled with an attachable tractor feed which looks big enough to prevent paper jams.

The Uchida is based on the Towa mechanism used in two other printers, the Sanyo WD100 and the Letter Writer SP2000.



Juki	Logitec	Smith-Corona	Uchida	Brother	Byewriter		
6100	WP-550	TP-II	DWX-305	HR-15	Praxis 35	Praxis 40	Praxis 45
\$995	\$708	\$595	\$950	\$845	\$799	\$845	\$1170
17(s)	12-14	12	20	13	8-12	8-12	8-12
15.6	10.8	—	13.1	12	—	—	—
11	11.5	10.5	12	11	11	11	11.9
13	13	13	13	13.5	12	13	13
100A	100	93	96Q	96P	100	100	100
yes	—	yes	no	no	no	no	no
10/12/15/PS	10/12	10/12/15	10/12/15/PS	10/12/15	10/12/15	10/12/15	10/12/15
1/120	—	—	1/120	1/120	—	—	—
yes	yes	yes	yes	yes	no	no	no
6	6	6/4/3	6/3	6/4/3	4 settings	4 settings	4 settings
1/48	—	—	1/48	1/48	—	—	—
yes	no	no	yes	yes	no	no	no
2.1	1.6	—	—	2.5	—	—	—
63	65	—	58	65	—	—	—
50	70	120	80	50	38	38	38
2500 (25%)	12M chars	—	2000 (25%)	3000 (25%)	—	—	—
12.5	—	8.4	9.5	8.9	9.7	8.8	9.8
P,S	P and S	P and S	P,S	P,S	P	P	P,S
pin	—	—	—	Kbd	Kbd	Kbd,	LCD
T,S	—	T	T,S	T,S,K	—	—	—
IBM	—	—	Q	P	0	0	0
2K/8K	—	—	256 bytes	3K	—	—	—

\* From DWX305 time.



#### Notes:

1. Price for unit with friction feed only;
2. For claimed speed, (s) indicates Shannon text rating.
3. Paper width with tractor; single sheet width may be larger.
4. Daisywheel: Q=Qume; P=proprietary; A=Adler; F=Facit; others unknown.
5. Diablo 1610/630: emulates Diablo 1610 or 630 printer.
6. Character spacing: most printers allow proportional spacing under software control
7. Slew is paper feed rate.
8. MTBF: mean time between failures at the indicated duty cycle.
9. Interfaces: P=Centronics parallel; S=RS232 serial.
10. Features: pin=internal pin feed; Kbd=attached keyboard. LCD=built-in liquid crystal display.
11. Options: T=tractor feed available; S=sheet feeder available; K=keyboard available.
12. Ribbons: O=Olivetti; P=proprietary; Q=Qume IV; D=Diablo; IBM=Selectric-style cartridge.
13. Buffer: size of print buffer installed/available.



Reconfigured the way it was supposed to run most efficiently, as a Qume Spring 5, the improvement was about 20 per cent, to 6 min 27 sec — anything but lightning fast and leaving some doubt as to whether the printer had really been set up as it should be, even though the quality of the printout was fine.

Uchida uses widely available Qume daisywheels and ribbons. No price was set for its serial and cut sheet-feed options.

The printer is fully featured with the only minus being the small buffer of 256 bytes.

Micro Buff is at 449 High St, Mt Waverley, Vic 3149. Telephone: (03) 277 7754.

The Uchida is also distributed by NSW company Electrical Equipment Ltd, 192 Prince's Highway, Arncliffe 2205. Tel: (02) 597 1155. The printer is also available from Dick Smith Electronics.

Printout from the Uchida DWX-305

## LETTERWRITER SP2000

Yet another printer based on the Towa daisywheel mechanism is the Letter Writer SP2000. It differs from the Sanyo WD100 and the Uchida DWX-305 only in appearance and price.

Like the WD100, the SP2000's case has a hinged top, but this does not reach to the front of the machine because the membrane-switch control panel has been repositioned to the top front of the case. The DIP switches have also been repositioned conveniently to a knockout panel next to the cable socket on the

backplane of the printer.

While Uchida was the only product tested which claimed 20 char/sec, its test times did not place it correspondingly ahead of competitive models. The first, ultimately restrictive, test was with WordStar configured as a standard printer without even backspace, and in that mode it took 7 min 53 sec.

The parallel version of the SP2000 retails for \$999, with the serial option for another \$127 — and the tractor feed for \$157. A sheet feed will be available soon for about \$599.

Printer Peripherals Pty Ltd is at 159 Brougham St, Kings Cross, NSW 2011. Tel: (02) 357 2864. **m**

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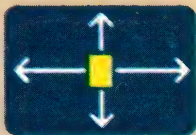
*. . . But can you tell the difference between run-of-the mill software and a system that is really special?*

General Systems offers you this challenge! Test your word processing I.Q.

## THE QUESTIONS:

### 1 EDITING

Which kind of editing operation is quickest to execute and easiest on the eyes of the word processing user?



- Full screen editing allowing for easy cursor movement around the screen?
- Moving the cursor around by doing a line count?
- Editing on the bottom line of text only?

### 2 DOCUMENT LAYOUT

You have created a document and want to see what the finished article will look like. Should you . . .



- View it on the screen as it would come out of the printer?
- Run it through a pre-processor to see what it looks like and then, if you like it, print it?

### 3 KEYSTROKES

Using a well designed wp system, how many keystrokes should it take to execute the most often used w-p functions?



- One easy stroke with no codes?
- Two or more with complex w-p codes?
- Three or more?

### 4 FLEXIBILITY

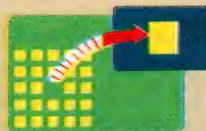
As the business manager of your company, you would like to find w-p software that you can tailor to your company's specific needs. Should you . . .



- Look for w-p software that allows you to change and add menus, and change function keys?
- Write your own custom software?

### 5 RETRIEVAL

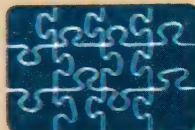
If you want to retrieve information quickly from a large database, which w-p software should you choose?



- One that can access a particular record by going to it directly?
- One that searches through all the records on the database sequentially until it finds the right one?

### 6 COMPATABILITY

As a manager of MIS, you want a w-p system that can be integrated with any other compatible application software. Should you choose w-p software with . . .



- ASCII formatted files?
- Software which requires non-printing characters in its file system and/or specially formatted files.

### 7 MATH

Your company has a number of financial applications and is looking for a w-p package with math capabilities. Should you choose . . .

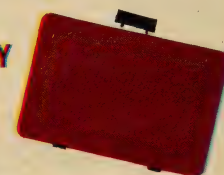


- On screen calculating allowing for editing, storing and recall of equations, calculations integrated with your word processing applications?
- Software where the math capabilities are tied to the list processing module?
- A separate math package?

### 8 PORTABILITY

Should you choose

- W/P — DBMS that runs on a wide range of CPUs from micros up to super-minis — in exactly the same way, with the same features and with your existing peripheral equipment.
- W/P which runs on a limited number of micros only.



## THE ANSWERS:

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**The Lookup function is a little-used feature of spreadsheet programs. Antony Whitlock explains how to use the function to calculate the effects of inflation on spreadsheet models.**

# INFLATING Your Spreadsheet

TUCKED away in almost every computer program dealing with money is a bomb called inflation. If you don't correct for inflation, all your money figures before June 1976 will be a least 100 per cent misleading when you compare them with today's figures.

Any figures going back to 1970 will be about 400 per cent off. Arithmetical precision to 16 decimal places is small consolation for such gross errors.

Tens of thousands of Australians now record their investments on personal computer or business micro spreadsheets. Fortunately, many of these spreadsheet programs have a little-used function with which you can deal with inflation and keep its effects before your eyes every time you print out your records.

This is the Lookup function. Spreadsheets which have it include SuperCalc, VisiCalc, MultiPlan, Micro DSS/F, MicroPlan, PeachCalc, MagiCalc and Plan80.

CalcStar, Desktop/Plan II, Execuplan II, Masterplan, MicroFinesse, PlanMaster, Planner Plus and Target did not have the Lookup function in their early versions, but later editions may have added it. Even if your spreadsheet does not have Lookup, there is a simple program given at the end of this article which will enable you to get the same advantages.

This is how the Lookup function works. You enter a series of reference numbers down one column, and in the next column to the right you run the operating figures. You refer to the reference numbers either with a number or a formula or a cell reference, and the program then picks up the relevant operating number next to that number in the same row.

You can also use a row instead of a column for the reference figures and the next row below for the operating figures. That makes for an awkwardly-shaped plot if you have dozens of figures and is not practicable for the

80 or more references needed in this exercise.

SuperCalc and many other spreadsheets have a Net Present Value function for discounting and so on, using a fixed percentage at each time interval. This is fine for working out regular mortgage payments or interest, but as inflation isn't a constant (and neither is interest these days) you can't use the NPV function for inflation.

The best inflation indicators in Australia are the quarterly Consumer Price Index figures. Although the CPI does not set out to be an index of inflation, everyone takes it as the best available. News stories on the CPI each quarter are usually headlined on inflation and, of course, the CPI is wheeled before arbitration and industrial courts as an argument for wage rises.

Every three months, the index measures changes in the cost of a "basket" of items in eight groups — food, clothing, housing, household equipment and operation, trans-



portation, tobacco and alcohol, health and personal care and recreation and education. There are CPIs for each State capital and for Canberra and Darwin and weighted averaged for the eight cities and the six State capitals.

Newspapers use percentage changes in their announcements rather than the actual index. In fact, most daily papers and even The Australian Financial Review did not give the actual index figures in their reports of the last CPI. You can work out the latest CPI from the previous one with this formula.

$$\frac{\text{Old CPI} \times (100 + \text{percentage increase})}{100}$$

The accompanying table gives the all-groups, weighted-average, six-State capital city Australian Consumer Price Index for each quarter of the 20 years since March 1964. To the left of each CPI figure is the reference number representing the number of months elapsed to the present. Because the Australian Bureau of Statistics issues the various consumer price indices every quarter, the reference figures run in multiples of three.

Here's the principle of using the CPI figures and the Lookup function to show ourselves the changing value of investments.

Head a column NPVC (for net present value cost) and in that column multiply the original cost by the current CPI (for January-April 1984 it is 132.5). Divide that by the CPI at the time of acquisition and there's your NPVC.

So that our spreadsheet will automatically make the correct adjustments for inflation as time goes by, we need to know how many months have elapsed since the acquisition, what the CPI was that many months ago and, of course, what it is today. If we enter in each row of our investment figures the month and year of acquisition and have the current month and year at a reference point on the sheet, a simple automatic program will throw up the number of months which has elapsed.

If you want to go back further than

the 20 years given here, you can get a listing of the CP indices back to 1954 posted to you for the cost of a phone call to the Australian Bureau of Statistics in your capital city. In any case, you will need to update the index every quarter and you may need to ring the ABS.

The bureau usually issues each CPI shortly before the end of the month following the quarter (for example, the March 1984 quarter figure was issued late in April). For our purposes there is little difference in the CPI figures for the various State capitals but, for consistency, use the all-groups, weighted-average, six-State capital city figure, which was 132.5 for the December 1983 quarter.

[Twenty years ago, the figure was 28.7, which means that a house for which you paid \$20,000 in 1964 should now be worth \$92,334 just to keep you level with inflation].

Not so long ago, "two bob" was a term of derision. Only someone who was two bob in the pound would expect a two-bob watch to last more than a week. Now, thanks to inflation, our dollar today is worth not much more than two bob was 20 years ago, when decimal currency was a couple of years away.

For the benefit of readers who weren't around then, two bob was a florin, which was two shillings, which became 20¢ in 1966.

The following programs and samples use SuperCalc, but can be translated either directly or with minor modifications to most other spreadsheet programs with the Lookup function.

To get the months elapsed since you acquired the money or investment you are looking at, provide two narrow adjacent columns (each three characters wide) in your spreadsheet. Enter as figures (not as text) the month of acquisition (1 to 12) in the first column and the year (75, 83 and so on) in the next column.

Also enter, perhaps somewhere on the top line, the current month and year in similar figures and keep these up-to-date (C1:3 and D1:84 for March 1984). Here's a simple program from, say, row 6 of your

spreadsheet to give you the months elapsed to date. Use this program in, say, the whole of column G, which you can head "Months" (or Mos):

$$(C1-C6)+((D1-D6)*12)$$

To get the present value of the original investment (NPVC), use this program, replicated throughout the whole of a column:

$$(H6/LOOKUP(G6,T4:T83))$$

$$*LOOKUP(0,T4:T83)$$

H6 is the cell holding the figure you are examining, which is the cost of the original investment. Column G is the column of the months elapsed. Column T (rows 4 to 83) holds the reference figures (the whole range of the months elapsed). It is to the left of the appropriate CPI figures (which are in rows 4 to 83 in column U).

When you replicate the above formula, and also the months elapsed formula (much easier than keyboarding it each time), use the "Ask for Adjustments" feature, which will keep column T and the C1 and D1 numbers unchanged no matter which row the formula goes into.

As the ABS issues the figures quarterly, the reference figures are in multiples of three (months elapsed), starting with zero. Lookup functions may vary between different makes of spreadsheets but, with SuperCalc, a reference number not shown in the table (such as 1, 2, 4 or 5 in this three-monthly series) will activate the operating figure opposite the next lower reference number. That is why it is important to start your table with a zero referring to the latest CPI. All figures representing an elapsed life of 0, one or two months will then reference the current CPI.

If this is not done, some spreadsheets will show an entry N/A (for not applicable) where you would expect to find a figure. As new CPIs come out each quarter (their effects always make the front pages even if the actual figures don't) you will need to enter them on top of the CPI table (column U in this case) and move the CPI figures



down one row to make room.

When you first enter the three-monthly reference figures (0, 3, 6 and so on), enter 0 in row 4, or whatever you use as your top row, and enter T4+3 in the next row. Then replicate that row for the rest of your table. It saves keystrokes.

Enter near the top of your sheet the range excluding the CPI Lookup table so that you can instruct your printer not to print it out. Do not blank the table out at any stage or it may throw error messages into the spreadsheet, which will then need tiresome correction. When altering the CPI Lookup table, copy it to the right, alter that and then move the corrected columns back over the old columns.

If your spreadsheet does not have the Lookup function, you can still use the CPI figures by keeping the CPI table alongside you when entering. Use this formula for the net present value cost:

**(H6/[relevant CPI for acquisition date])  
\*[current CPI]**

For the current CPI, use a fixed position cell so that each three months you merely need to change that one cell and it will be rippled throughout your spreadsheet. It may shock you to see that the 100 EZ Industries shares which you bought in 1969 for \$450 now have a net present value cost of \$1728, or \$17.28 a share. With a current stock exchange price of less than \$6 a share, you will have had a capital loss of more than \$1000 somewhere along the line if you sell now.

It's not as bad as it looks, because EZ Industries has had several share issues over the years at below-market prices, but even so, you're still hundreds of dollars down. Yet the traditional spreadsheet would show you that you paid \$4.40 a share and, as buyers are today offering \$5.64 a share, you have a capital gain of 28 per cent.

If you like, you could add to your spreadsheet a column headed Adjusted Capital Gain, which in this example would show -384 per cent.



## CONSUMER PRICE INDEX All Groups Index Numbers

(Base: 1980-81=100.0)

Date	6 State weighted average	Date	6 State weighted average
<b>1964</b> March	28.9	<b>1974</b> March	47.1
June	29.1	June	49.1
September	29.5	September	51.6
December	29.8	December	53.5
<b>1965</b> March	30.0	<b>1975</b> March	55.4
June	30.3	June	57.4
September	30.6	September	57.8
December	31.0	December	61.0
<b>1966</b> March	31.1	<b>1976</b> March	62.8
June	31.3	June	64.4
September	31.4	September	65.9
December	31.7	December	69.8
<b>1967</b> March	31.9	<b>1977</b> March	71.4
June	32.2	June	73.1
September	32.7	September	74.5
December	32.8	December	76.3
<b>1968</b> March	32.9	<b>1978</b> March	77.3
June	33.2	June	78.8
September	33.3	September	80.4
December	33.6	December	82.2
<b>1969</b> March	33.9	<b>1979</b> March	83.6
June	34.1	June	85.5
September	34.3	September	87.8
December	34.6	December	90.4
<b>1970</b> March	34.9	<b>1980</b> March	92.4
June	35.4	June	95.0
September	35.6	September	96.8
December	36.3	December	98.8
<b>1971</b> March	36.7	<b>1981</b> March	101.1
June	37.3	June	103.4
September	38.0	September	105.5
December	38.9	December	109.9
<b>1972</b> March	39.3	<b>1982</b> March	111.8
June	39.6	June	114.5
September	40.2	September	118.5
December	40.6	December	121.9
<b>1973</b> March	41.5	<b>1983</b> March	124.6
June	42.9	June	127.3
September	44.4	September	129.5
December	46.0	December	132.5



# SIEMENS

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**The introduction of microcomputers to the workplace is posing new problems for large organisations as they find that distributed processing also requires distributed education on a large scale. Nigel Davies offers some solutions.**

# TRAINING the USER

WHAT effects will the introduction of microcomputers have on existing data processing practices in large organisations? What new concepts and skills do users require in order satisfactorily to operate the new equipment?

Before trying to answer these questions, consider the following scenarios:

On the top floor, the managing director completes a spreadsheet model which miscalculates his company's capital expenditure budgets for 1985. He did not "lock" the formula cells and, as a result, was able inadvertently to amend one of the mathematical expressions.

On the bottom floor, a secretary loses a week's word processing. She was not provided with a menu-driven backup program so she used PIP. By transposing the old and new file names, she overwrote the cur-

rent master file with an old backup copy.

Meanwhile, a salesman completes an impressive set of color graphic slides using an integrated spreadsheet/graphics package. Unfortunately, his audiences are destined to be totally confused by his untutored attempts at using colors to illustrate quantitative differences.

These are only three examples of the new range of disasters now available off-the-shelf to corporate microcomputer users. Users and DP departments must appreciate that the microcomputer is a real computer just like the mainframe and mini. Because it is often operated by new users, its capacity for abuse is greater than that of most computer systems.

For the first time, users are being given access to powerful small computer systems, complete with

spreadsheet and data management packages which can be used to generate suites of application programs. To use this equipment satisfactorily, users must be taught concepts and skills which go beyond mere tuition in hardware and software operation and keyboarding (these skills can often be learned adequately from disk-based tutorial software, as exemplified by the Select word processing package). Users of spreadsheets and integrated packages should receive instruction in the following critical subjects: debugging and testing, financial reporting standards, graphics, and disk and file management.

## DEBUGGING, TESTING

There is a basic contradiction in the use of microcomputers by management to produce management information. One rationale is that they provide fast and flexible



manipulation of data to support management decision making. But if the same data is manipulated by programs produced by the DP department, those programs are subject to testing, debugging and audit procedures designed to ensure consistent and accurate output.

Therefore, if quality control is to be maintained, standard software production controls must also apply to user-generated spreadsheet models — at the expense of much of

accidental alteration with cell locking commands.

### REPORT STANDARDS

Accounting reports are supposed to be timely, relevant and accurate. To help achieve this, all accounting reports have a title, are produced in a specified format for a particular purpose and from specified data sources.

As a result, it is possible to look at any accounting report and, from the

incorporates version numbers, the version number methodology. This will help ensure that all models are based on valid data.

**Model format:** Correct formatting techniques improve efficiency, in terms of both speed of hardware operation and speed and accuracy of output interpretation. The user manuals of most spreadsheet packages give some hints on constructing spreadsheets to minimise memory occupation and execution time.

To achieve maximum legibility, users should be taught to divide the model into sections by function. These should include a title/description section, a section for the definition of constants and global variables, and finally data and formula tables. The most significant item of data produced by the execution of a model should be highlighted and displayed next to the constant and global variables.

This allows the major input values which produce a particular result to be easily distinguished. If the Lotus 1-2-3 data table facility to automatically generate different outputs for a range of input values is used, such tables should be formatted in a similar fashion.

### GRAPHICS

The provision of integrated spreadsheets and color graphics has, for the first time, given many people the ability to produce color presentation material to a high standard of production. Users of color graphics should be aware, however, that the power of color as a positive influence is matched by its power as a negative influence if used incorrectly. Different cultures have different color preferences. Orange and yellow are poorly rated colors in western culture. Preference is given to blue, red and green in that order. Incidentally, more adult males (8.5 per cent) than females (0.5 per cent) are color blind.

Because of its subjective nature, color should never be used by unskilled people to show quantitative differences. A safer approach is to use different tonal gradations of a single color.

Examine a good atlas to see what

---

***Users of color graphics should be aware, however, that the power of color as a positive influence is matched by its power as a negative influence if used incorrectly.***

---

the speed and flexibility which provides the rationale for their use!

A starting point to achieve accuracy without sacrificing too much convenience is to instruct users in the technique of modular testing. This can be used to debug spreadsheets at several levels.

Some spreadsheets give the user a command to evaluate the contents of a single cell, allowing testing to take place at the individual formula level. This facility is particularly valuable to debug complex formulas involving conditional logic and lookup tables.

Spreadsheet models can be executed at any stage of preparation, just like interpreted Basic programs. Testing is greatly simplified by the use of this facility. If spreadsheets are to be linked, as it is possible to do with some packages, each spreadsheet should be proved correct before its output is fed into the next module.

The cell contents of the completed model should be printed out and the entire model desk checked. Testing with data should include ridiculous values, as well as minimum and maximum expected values. Conditional logic should be tested with both true and false conditions.

Once the model is debugged, formulas can be protected from

title (trial balance perhaps, or profit and loss statement), know exactly what the report is intended to demonstrate. The use of a standard format for each type of report enables reports to be interpreted by anyone with basic accounting knowledge. Users should be instructed in the application to spreadsheet models of the same rules that apply to accounting reports. Here are some suggestions:

**Model purpose:** A common fault in spreadsheets is to try to show too many relationships in one model. This results in the model being slow to execute, more difficult to debug and the output more difficult to interpret. It is better to highlight a single major relationship in each model (the same applies to the use of graphs). If summary information is required, this can be achieved by linking models.

**Model documentation:** The first line or two of a spreadsheet model should give the model title, author, date written, and any linked sheets supplying data to or receiving data from the model. If data is downloaded from mainframe files (or even entered by hand from printouts), the internal documentation of a model should include the recommended source file name and, if the file name



can be achieved by skilful use of color, but remember that cartographers have been perfecting the art for centuries.

Because of the subjective nature of color and the level of expertise required, it is difficult to satisfactorily train people in its use. One solution may be to employ an expert to define standards for the use of color, graph types, layout, labeling, scales, and print fonts.

These should then be tested across a range of output media (such as overhead projector slides, 35mm slides, graph plotter, color print) for color integrity and legibility. Refer to *The Computer Image*, published by Addison-Wesley, for a fuller treatment of this subject.

## DISK MANAGEMENT

The purpose of teaching disk and file management techniques to users is to help them achieve easy identification and location of files (which may be spread across a large number of floppy disks or other storage media), security of programs and data from accidental or deliberate misuse and foolproof backup and recover procedures.

An Australian Micro Computer-world article, *Library Pitfalls* (AMC, Nov. 1983, page 27) suggested methods by which these objectives may be achieved.

A user-friendly operating system makes a significant difference to the ease with which these techniques may be taught. DEC's implementation of CP/M-86/80 on the Rainbow 100 is an object lesson for other suppliers in this regard.

A single command (MAINT) operated by cursor control and function keys can be used to emulate many of the functions of the standard CP/M DIR, STAT, ERA and REN commands. A menu-driven COPY utility replaces the backup function of the PIP command. In the absence of such a utility, the DP department should consider preparing batch operating system command files to copy files for users, (for example, using SUBMIT on CP/M and .BAT files on MS-DOS).

Backup becomes increasingly complicated for hard disk users without tape streaming, because of the increased number of files on a single storage volume. Under such circumstances, users of MS-DOS 2.00 will find the menu-driven ARCHIVE and RESTORE selective backup and recovery utilities of great assistance.

On most occasions backups from hard disk spread across several floppy disks. ARCHIVE helps the user in disk management by writing a sequence number to each floppy disk. The sequence numbers are

checked when the disks are read by RESTORE.

Some packages, such as dBase II, assist the user by providing automatic backup of amended files such as retention of updated dBase command files with the .BAK file extension.

## CONCLUSION

Many recommendations here are not new; they are based on the adaptation to the microcomputer environment of existing programming, systems analysis and accounting standards. The factors which are new, and which large organisations will have to plan for, are the number of employees who will require basic training such as that outlined above, and the total lack of computer background knowledge on the part of most of those employees. Because of the lack of grounding in basic EDP skills and concepts on the part of these employees (and because of their relative seniority, in many cases) a more user-friendly form of instruction is required than is normally given to DP professionals.

The extent to which a co-ordinated training policy is planned before microcomputers are installed will be a significant factor in determining whether or not projected benefits are attained. **m**

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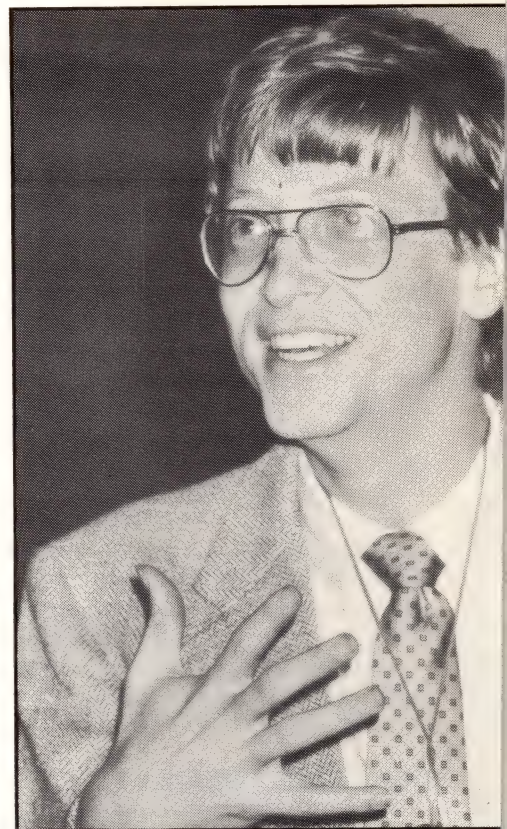
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Microsoft chairman Bill Gates is the most influential person in the microcomputer industry. A conceptual designer, with a clear vision of the place of software in the information age, he has a passionate belief in the capacity of the market to define what is possible with the technology. Ian Webster listened to the message while Susan Coleman asked the questions.



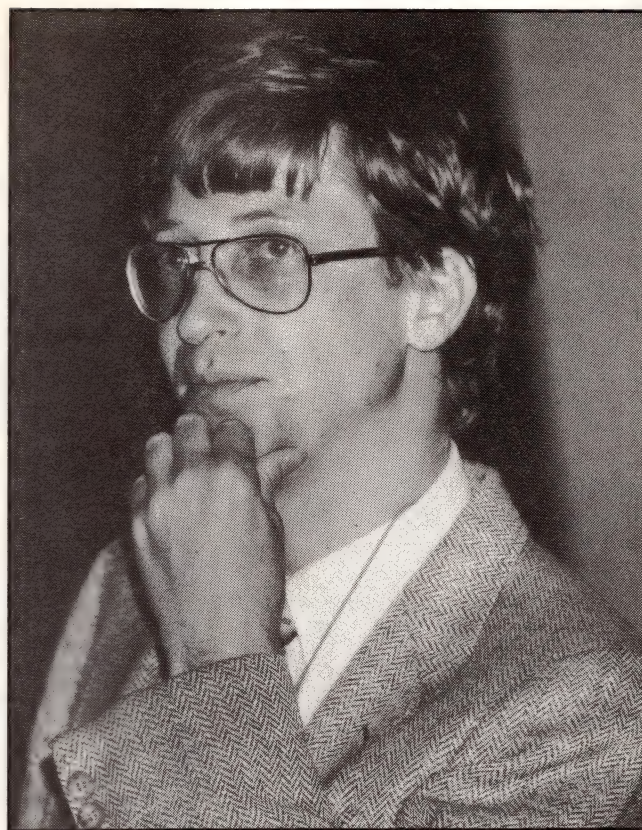
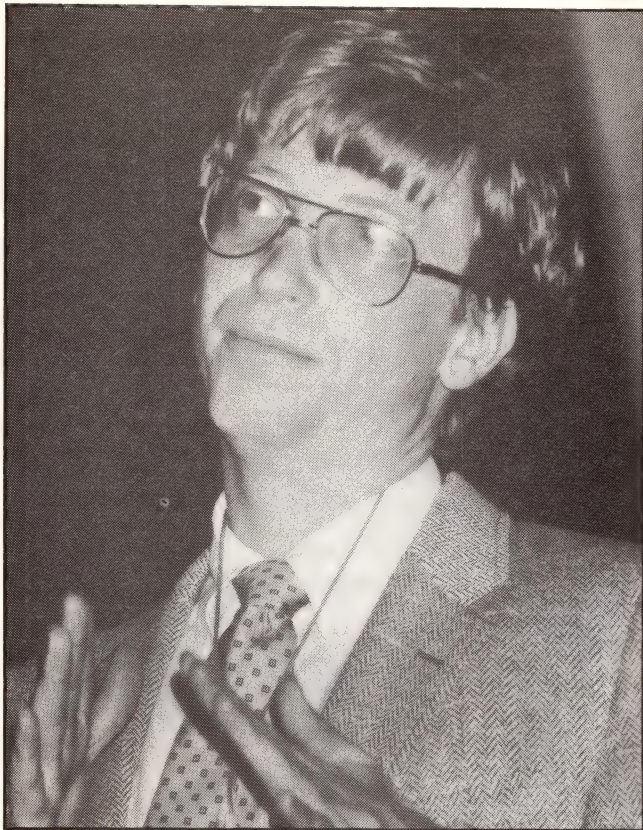
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# GATES ...

BILL Gates' company, Microsoft, has become the biggest microcomputer software company in the world, driven by Gates' passionate belief in the importance of software and his trust of the market.

Microsoft has been closely involved with almost all of the important microcomputers from the very early days of the Altair to the Apple II, Commodore Pet, Tandy Level 1 and, more recently, the IBM PC, Macintosh and the handheld portables from Tandy and Nec. The company's Basic interpreter is the most widely used program ever written, with almost every microcomputer user having used this Microsoft code.

Gates spent most of his time in Australia during the recent PC84 week talking. He talked to the press, talked at the PC conference, went to Canberra and talked to Science and Technology Minister Barry Jones, talked to the industry and he spent a lot of time talking to users.

This was the big difference bet-

ween Bill Gates and many of the other industry notables who come to Australia. He is interested in users, always ready to demonstrate a machine or to deliver a flood of words in an attempt to explain the magic behind the screen.

Australians are not used to dealing with people who have a clear vision of the computer industry, being used to qualified personal opinion, marketing hype and third-hand rumors, which tends to promote a technical cynicism that turns into a distrust of naive users and the market.

Gates believes in the discipline of the market. He encourages a combination of advanced research and hot product mentality where a product's position on the Softsel Top 100 is as important as a new algorithm.

"You have to track the current level of hardware," he says. "You have to be in the market for the current level of hardware; you can't get behind or in front."

He believes that chip technology

drives the microcomputer industry forward and has pioneered an innovative approach to design, pursuing close development relationships with chip manufacturers and hardware companies. Effective products can only be developed and delivered when all three get together, he says.

Gates acknowledges that this development of standards by the market is a problem, as they always restrict innovative options. Despite describing the Intel 8086 architecture as "super painful" to work with, largely because Intel was devoting all its resources to an object-orientated processor called the 432 when the 8086 was developed, he says the MS-DOS/8086 architecture is a stable base that can support the demands of software for the rest of the decade and there is no need to go looking for different architectures.

He says speed is very important. "You need all of the cycles you can get," he says. He expects to see systems soon that run 10 times faster



than the IBM PC using faster clocks and the new processors in the Intel 8086 family. He also expects a tenfold increase in graphics processing speed using new graphics and memory chips.

Graphics is Gates' current obsession. He isn't talking about graphs or charts or diagrams, but about the use of the bit-mapped screen for all display purposes. "It just makes user interfaces so much easier to design," he says. "New machines will only have one display mode and that will be graphics."

Many people have wondered why IBM put the IBM PC video on a separate card rather than putting it on the motherboards as is usual. Gates claims credit for the idea, saying he was concerned about the rapid development in video technology when Microsoft was working with IBM on the design of the PC. He convinced the IBM designers to put it on a card so it could easily be upgraded.

He says the current standard of 640 x 200 is moving quickly to a 640 x 400 standard and confirmed rumors that IBM will release an upgrade to this resolution. He also confirmed rumors that the original design for the PC was for a Z80-based system with an add-on disk drive.

Gates continually refers to the need to develop principles of software design. He says Microsoft's efforts have been directed toward producing productivity tools based on a science of software ergonomics. His evolving list of principles for good software design include: use few commands consistently, display the entire command menu on the screen, use appropriate metaphors, use property sheets, avoid special cases and provide immediate visual feedback.

No software product can succeed today, he says, without context-sensitive help files, computer-based tutorials and carefully engineered documentation, and he makes the point that Microsoft employs 150 programmers and 150 people involved in the design and production of support material for the code.

Gates' view of operating systems is that they provide a platform to sup-



**Bill Gates is always ready and eager to demonstrate his products.**

port applications software. This is important both for applications developers and users, as it allows compatible software to be supported in different hardware environments.

"As the principles of doing a new set of functions are agreed on, then they should be shifted down into the operating system," he says. "This is now happening with graphics and will soon extend to networking. Database primitives will also eventually move into the operating system, but there is little understanding or agree-

ment about how they should be implemented."

He explains the networking functions in the new release of MS-DOS as allowing any file access to reference remote resources. The syntax will involve the use of extra back slash characters (\\master network\\ machine nameXfile path). He stresses the importance of intelligent file servers for networks and expects 1984 to be an important year for networks. He expects people to start agreeing on implementation strategies.



Gates' success is based on his abilities as a conceptual designer. His commitment is to progress. "The latest and greatest machine is always my favorite," he says.

He is able to connect many of the different levels of the microcomputer industry, acting as a technology broker and providing software where there is an opportunity. He says he is proudest of the handheld portables, which were designed by Microsoft (both hardware and software), and built by Kyocera to order from Tandy and Nec.

"The whole project was 90 per cent Microsoft. We just took advantage of a market opportunity and that's what this business is about," he says.

Talking about the future of software development, he uses the term "softer software". Softer software moulds itself to the individual user's requirements by recording the user's input and reorganising its resources to adapt to the user's pattern of use. The first applications will be in the use of intelligent keyboard Macro and Undo facilities and context-sensitive Help files.

He expects the concept to be important in the development of data management products, at present the great unknown for software developers. The techniques may provide a path between the access speed of hierarchical systems and the flexibility of relational systems. A soft database will mould itself to the access paths of the user, with the computer deciding on the necessary index structures by analysing the user's past requests and the resources the system has available.

"It's all moving towards artificial intelligence," he says. "In 10 years, Microsoft will be an artificial intelligence company and software will be the key ingredient in all advanced products. It's going to be pretty awesome."

Just before Gates went to the Barrier Reef for a couple of days before resuming his world tour he was interviewed by Computerworld editor Susan Coleman.

**Coleman:** As a software designer and programmer, whose microcomputer do you like best?

**Gates:** I like the newest and greatest

machine. IBM's machine, when it was introduced, was the best; and now, 2½ years later, the Macintosh. If there was ever a machine that Microsoft did 99 per cent of the work on, it was the Tandy 100. But there are nice features about all my customers and there are 600 of them, so I can't name them all. You can't really say what is the best.

**Coleman:** If you had to attribute your success in percentages to two areas, your technical ability and your marketing skill, which value would you attribute to each?

**Gates:** Technical skill? It is hiring and managing smart people, which require considerable technical skill. People have to respect your technical abilities. They have to feel like, if you look at a thing, you could do it. You can often see whether they are being lazy and sloppy. Managing and hiring is crucial. Every company has to have a leader who gets people enthused.

**Coleman:** What about the meetings you have had with several manufacturers and OEMs which were critical to your products' acceptance, and your intimate connection with Steve Jobs? You see that as a marketing skill, surely.

**Gates:** Certainly. I am a salesman. Fortunately I sell on the technical merits, but I sell to Steve and to Phil Estridge and John Roach and all those people. The key to the company's success isn't totally that, but that is pretty handy. Let's take a new product like Windows. I call up the people I know and I talk to them personally. There's a lot of goodwill and belief in what we are doing, and they are willing to jump in, particularly if I call personally. Most of the guys I deal with wouldn't have any concept. I am more technical than anyone I sell to, so I have got to use my technical credibility as much as an indepth technical explanation of things.

**Coleman:** Do you think it matters much if the product is fairly ordinary, provided that it works and it is well marketed?

**Gates:** We have more extraordinary products than any other company. If I had to rate the priorities, I would rate support and fixing problems over

having any extraordinary products. Why is IBM successful? It is because people really count on them to make the company solve their problems. We have been super-lucky in terms of hiring people. But the thing that carries the company through in the long-term is that everyone can count on it. Out of our products, one or two are going to be ordinary. But people can count on our backing those products in the long term.

**Coleman:** How important is IBM in the rise of Microsoft?

**Gates:** Microsoft was the first micro software company. We have always been the largest and had the most unit sales even before IBM. IBM is strategically our most important customer. I spend as much or more time with IBM as anyone else. They are important; they are super-important. The only product IBM really helped us establish was MS-DOS.

**Coleman:** What are your plans for designing a local area network interface into MS-DOS?

**Gates:** We are working in the local area network and expect announcements from our major OEMs by the end of the year.

**Coleman:** Where will MS-DOS be in five years?

**Gates:** It will be at the centre of office automation with its multi-tasking and networking and the Windows extensions we are so enthused about. By that time MS-DOS itself will have faded into the background. The user will not have to communicate with it much at all. I guess the next evolution is to build database primitives down into the thing, and I'm not sure what is beyond that.

**Coleman:** It is said that IBM paid you a flat fee for MS-DOS. Can you explain how IBM obtained it and how much you actually make from IBM?

**Gates:** We have an ongoing income from IBM. The structure is complicated enough and confidential enough that I'm not going to give specifics. Even if we don't enhance the product, there is an ongoing income. As long as IBM continues to sell PCs in any reasonable sort of configuration, Microsoft continues earnings.

**Coleman:** Could you give your IBM income as a proportion of your total



income for the year?

**Gates:** Slightly less than 5 per cent.

**Coleman:** With Concurrent PC-DOS 3.1 announced by Digital Research able to run both CP/M and PC-DOS applications, do you think IBM is going to dump MS-DOS?

**Gates:** They don't emulate MS-DOS. They emulate a subset of Version 1. Most applications out there make Version 2 calls, so they haven't done a complete job of the MS-DOS. They don't have our utilities. Also, they are carrying around the dead weight of CP/M. What benefit is that to users?

I get bored by questions about predicting what IBM is going to do. It is not going to have a multi-head operating system. It is going to have one which evolves out of and is compatible with the work we have done in the past. Take the PCjr. What is on that? What operating system? Rumors were rampant that they would have this or that. I know when it was announced that all the stuff about IBM would disappear because the machine would be announced and that would be it. Sure enough, it didn't happen. It was an MS-DOS machine. Every application was MS-DOS. Still the rumors go on. When IBM announces the next machine, the rumors will go on.

**Coleman:** What is the future of multi-user machines?

**Gates:** We have a 70 per cent share of the multi-user microcomputer base market with the Xenix stuff, particularly Tandy's Model 16, and they fill a pretty vital role. In some ways, the ideas of having single-user network machines will in time become an

alternative to buying multi-user machines. I would say that, in the far future, single-user networking will be a much faster growing market than the multi-user market. Xenix is all about the multi-user market, and will be a faster growing market for a long time.

**Coleman:** What are the differences between Xenix and Unix?

**Gates:** Xenix is a licensed version of Unix, so it runs all the Unix software. Xenix is a commercialised version of Unix. If the power goes down, you don't lose all your files, and it runs more efficiently. We have standards of things like record locking that is not available in Unix. We have brought up things like Multiplan on to the system. But there are many extensions that are part of Xenix.

**Coleman:** Which version of Unix do you see as the standard version, and are you going to fix Xenix on that version?

**Gates:** Bell has really brought things up — System 5, System 3 and 7. Now it is running all these, and they are incompatible with each other. In Xenix we actually recognise what a program was written for and we run in all those modes. We are just releasing the System 3 stuff now. They came out six months ago and we are incorporating that into Xenix and have got it out to the OEMs. So it is just being commercialised. Because of Bell's stature, System 5 is going to be it, so Xenix will support System 5 as well as System 3 and 7.

**Coleman:** How compatible is Xenix going to be with MS-DOS?

**Gates:** Well, in the sense that you can

just go out and buy. There are fundamental architecture reasons that it can never be at that level compatible. You will just have to recompile your application. We will take the same type of record locking, the same windows, the same type of user interface. So the two things are getting closer together in that sense. But they will never get as close as that. Xenix remains our multi-user operating system. MS-DOS is our single-user operating system.

**Coleman:** You said the Mac will be remembered as one of the classic machines. What are the other ones?

**Gates:** Obviously the Apple II and the IBM PC and the Xerox Alto. Those things will go into the history books. I think Tandy's Model 100 will, too. I am particularly biased on that as the first really portable user machine. It depends on how you view these things and how many awards you want to hand out. Commodore 64 and Wang are classic.

It's hard to say because this is a marketplace where there's a lot of evolution and very little revolution. Wang did some nice stuff; TI, HP too. I wouldn't put the PC XT on the list because it is just evolution. I don't try to get headlines in magazines, but it is nice for the end-users, so to pick something that is revolutionary is hard. I have to list the Xerox Alto which is the research machine used at Palo Alto Research Centre. It is very hard to give out those awards. There has been a lot of smart work done by a lot of my customers that is hard to recognise as revolutionary, though.

**m**

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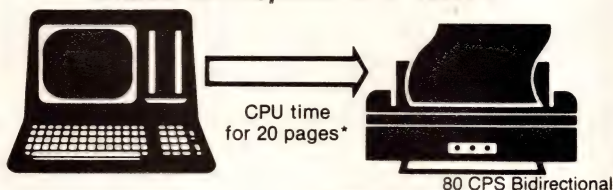


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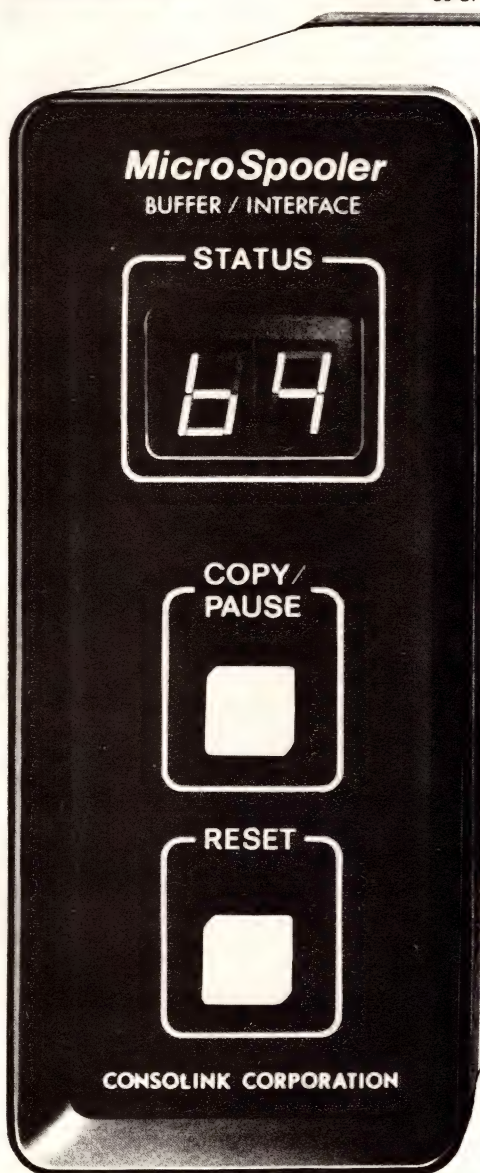
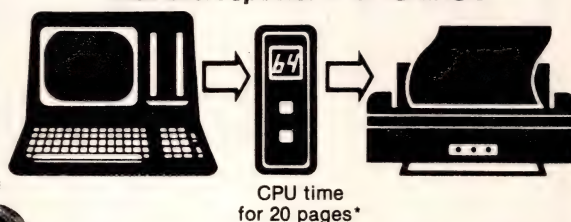
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**While still the poor relation to the microcomputer hardware industry, the software industry is growing rapidly.**

**The demands of massive growth are starting to affect some of the early leaders as Denise Caruso investigates the future of American software companies.**

# Every MICRO Has a SOFT Lining

WE'VE been hearing an earful lately about trouble in the American software business. We've seen all the duck-and-cover action of a suspect industry: insiders are whispering about companies on the verge of bankruptcy; some major products aren't selling well; managers are moving on or being fired. Even the unflappable Wall Street Journal ran a front-page story during the Softcon trade show in March headlined: "As software products and firms proliferate, a shake-out is forecast."

In the grander scheme of business history, the software industry is brand new. Although some companies are six or seven years old, there wasn't an industry to speak of until VisiCalc was introduced four years ago and kicked open the door to a complex, exciting consumer market that had to blend elements of big-time marketing strategies with technical experience.

When the industry began, nobody really knew anything about how to run a software company; there never had been any companies quite like these. Before personal computers, a software kit used to run to 1000 units or so and retail for \$US50,000 or \$US60,000. Now, with products like VisiCalc, WordStar, dBase II, Bank

Street Writer and Pinball Construction Set, companies could sell hundred of thousands of units for prices ranging from \$US50 to \$US700.

In the beginning, people decided to run their companies in a particular way; like a text-book publisher, perhaps, or like a government contractor. In other words, the original entrepreneurs bet that the industry would turn out in one way or another. What we're seeing now is whether those bets are paying off.

What's happening inside the industry is the same thing that happens in any new endeavor, accelerated mightily by this particular market's phenomenal growth rate. We're watching the industry come into the gawky period of adolescence in which growing pains and spurts will shape it into maturity.

First, the bad news. Some companies won't make it through puberty.

Consider the following: some small software companies are already being reorganised under bankruptcy laws. These include Sirius Software, Roklan Corp and others.

Other small software companies such as Softech Microsystems and Datamost are cutting back opera-

tions and laying off employees.

Some larger, well-known software companies — VisiCorp and Spinaker Software top the list — are rumored to have run out of cash for their operations and are searching for new money. All of these companies deny the rumors are true and insist that their financial positions are solid. If the rumors are true, however, the companies must be getting desperate, because virtually all respected venture capitalists and institutional investors say they now refuse to invest in software companies.

Many companies, large and small, are up for sale. In the past year, about 24 microcomputer-software companies were acquired by a wide range of companies from other industries, including mainframe software, book publishing and even entertainment. The companies looking to be acquired now, however, are not in as good a negotiating position as the companies acquired earlier.

Now, the good news. Some companies are still doing financially well. In what industry, after all, could a new company — Lotus Development Corp for instance — achieve \$US53 million in sales in its first year and end up with more than \$US50



million sitting in the bank?

"Well over half of the companies in this industry aren't profitable," says Fred Gibbons, president of Software Publishing. "I do have to say by exception that we, Lotus and Microsoft are extremely profitable."

What all this turmoil boils down to is that some software companies have made many mistakes. Early companies such as VisiCorp, MicroPro, Microsoft and Digital Research had no choice but to learn by braille, so to speak, about which strategies would work.

They had no real idea what was ahead of them or even how to make realistic projections of sales or market direction. They could only try to make good decisions without the use of historical references. Not all were successful.

As a result, corporate strategies are changing as fast as the ink can dry on the in-house memos. But the industry is taking a definite shape as companies change their strategies to fit the market in such key areas as product positioning, professional management, compatibility, marketing and distribution.

One example is companies' product-development strategies. Every industry has a product life cycle around which it plans its product introductions, marketing strategies, and research and development. The software business hasn't been around long enough to know how long a product's life cycle is — until now.

VisiCalc is the first successful software product to have gone through a complete life cycle, from conception in 1978 to introduction

in 1979 to peak success in 1982 to decline in 1983 to a probable death, according to industry insiders, this year.

In some cases, companies haven't paid enough attention to deciding which machines their programs would make the most money on. In other cases, they directed their attention to hot new product categories and failed to maintain the viability of their original products. Most importantly, many software companies placed little or no emphasis on the sales strategies essential for market penetration.

Well-known home-software publishers such as Electronic Arts, Spinnaker and Human Engineered Software (HESware) echo a sentiment something like: "Get a product anywhere and any way you can." Most are heavily involved in the acquisition of third-party software instead of developing products in-house, a process that's usually a necessity for publishers of productivity tools.

"The home industry is drifting," says Robert Fournier, director of entertainment product marketing for HESware, "and it's determined by economics. The 'garage to millionaire' thing is mythology. The publishing model — massaging a third-party product, editing and distributing it — is taking over."

Flexibility in product selection is the only way to win in the home-software market, Fournier says.

Both home and business-software markets have been irrevocably affected by Apple's success and IBM's entry into the personal and home-computer markets.

The fact of life for software companies is that they are volume driven; therefore their products have to run on machines that have sold in large numbers and will be around for a long time. Most notable in this category are both the Apple II and the IBM Personal Computer.

Mitch Kapor's decision to format Lotus Development's Lotus 1-2-3 program for IBM PC clinched its success — and filled Lotus's coffers with plenty of money to investigate (rather than gamble on) new technology.

IBM's domination of the personal computer market means one of two things to the hardware and software industries.

"Either you have to be PC-compatible or very special," Kapor says. "Mac is the first thing in the post-IBM era that's really special. And yes, right now it's come down to Apple and IBM."

"We're thrilled about the Macintosh. We're doing a lot of work on Macintosh stuff, as well as with lap-computer technology. And by 1985, we'll be working in 32-bit architecture, getting involved with computers that can do more than one thing at a time."

IBM has been a positive force for Lotus. But there's a dark side to wooing the giant full-time.

"It's really not IBM that's the competition, it's the environment that's the old chestnut," says Kapor. "Look at what Compaq and Eagle go through when IBM announces a portable. It just shows you that what IBM does will fundamentally shape the industry."

"That puts us in a position to have

## Top 20 microcomputer-software companies by 1983 sales figures

*Figures were provided by the companies, company insiders and industry analysts.*

1	MicroPro International	\$60,000,000	10	Broderbund Software	\$13,000,000
2	Microsoft	55,000,000	12	Sierra On-line	12,500,000
3	Lotus Development	53,000,000	13	Sorcim	12,000,000
4	Digital Research	45,000,000		Software Arts	12,000,000
5	VisiCorp	43,000,000	15	Sirius Software	11,000,000
6	Ashton-Tate	35,000,000	16	Epyx	10,000,000
7	Peachtree Software	21,700,000		Perfect Software	10,000,000
8	Microfocus	15,000,000		Softword Systems	10,000,000
9	Software Publishing	14,000,000		Spinnaker Software	10,000,000
10	Human Engineered Software	13,000,000		Information Unlimited Software	10,000,000

Source: SoftLetter



to be nimble, to be prepared to respond to whatever IBM may do. There's a certain vulnerability in that what IBM does may be more or less favorable for software companies altogether."

Microsoft is widely recognised as the most influential company in the microcomputer-software industry. Claiming more than a million installed MS-DOS machines, founder and chairman Bill Gates has decided to certify Microsoft's jump on the rest of the industry by dominating applications, operating systems, peripherals and, most recently, book publishing. Some insiders say Microsoft is trying to be the IBM of the software industry.

Although Gates say he isn't trying to dominate the industry with sheer numbers, his strategy for dominance involves Microsoft's new Windows operating system, which allows many different programs to hook up under MS-DOS and exchange data, as well as run independently.

"Our strategies and energies as a company are totally committed to Windows, in the same way we're committed to operating-system kernels like MS-DOS and Xenix," Gates says. "We're also saying that only applications that take advantage of Windows will be competitive in the long run."

Gates claims that Microsoft's entrance into the application market with such products as Multiplan, Word and the new Chart product is not a big-time operation.

"I think it's going to kill Microsoft," says one software industry leader, who asked to remain nameless. "They're great at operating systems, but they don't know enough about the applications market to do it well."

The problem with diversification such as Microsoft's and VisiCorp's is that companies can stretch themselves too thin. Microsoft's research and development team has an unlimited budget, for instance, that does not come under control of the company's experienced president, Jon Shirley, a veteran manager who cut his teeth at Radio Shack.

If Microsoft ever hits a rough spot, it may have difficulty bringing it's

R&D expenses under control. "Over-expansion is crazy, it's the worst thing you can do," Kapor says.

One significant lesson some companies have learnt about the software business is that making mistakes isn't fatal. Digital Research Inc and MicroPro International are both companies that ran into trouble early on.

operating system for a new IBM computer.

The changes the company has made appear to have paid off. It was recently able to persuade European investors to make a private placement of \$US22 million in the company, which is one of the largest investments ever made in a microcomputer-software company.

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## ***The 'garage to millionaire' thing is mythology. The publishing model — massaging a third-party product, editing and distributing it — is taking over.***

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MicroPro, for instance, lost money in late 1982 because of too-rapid expansion. It laid off nearly half of its employees and tightened up operations. Now it has registered to go public, reported the highest sales of any microcomputer-software company and shows respectable profitability.

Digital Research got caught by changing hardware standards after IBM introduced the PC with an operating system written by Microsoft. Digital Research's operating system (CP/M-80) still has a lock on the market for 8-bit computers, but that market is now less important than the 16-bit market.

Digital Research has made a number of smart moves in order to regain its former momentum. It has introduced multiple versions of its CP/M operating system for the IBM PC, including multi-tasking and concurrent versions. It has translated its languages to work with MS-DOS as well as with its own operating system. It has also begun to market applications software and to make ready-to-run, CP/M-compatible versions of popular software available through retailers.

The company has also been working hard to develop other relationships with IBM and has just agreed to translate its languages for the IBM 3270/PC. Rumors are flying that it is also working on an

The changing of hardware standards, the risks inherent in diversification and the vulnerability of a one-product position in the market are not the only problems that beset the software industry.

Some basic premises are also being questioned. SRI recently completed a study that claims the potential computer-buying market is much smaller than companies believe. If this is true, then everyone, including successful companies like Lotus, Microsoft and Software Publishing, will be scrambling for the last scraps of sales before the market for higher-end productivity software dries up. That will be a shakeout.

Shakeout is a scary term in an industry that is populated by more than 5000 companies. Although some of these companies — in fact, Fred Gibbons would say that most of them — are destined to fall by the wayside, "shakeout" is far too harsh a word. It suggests a financial stalemate, a glutted market, too many products — a market that's either stopped growing or is on a decline.

But people are still buying plenty of computers, which probably means that they'll keep buying software too. There's still plenty of money to be made by people with ideas and the wherewithal to get the money to implement them. **m**





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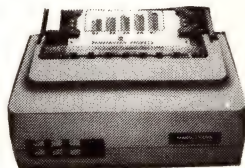
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**Australian microcomputer manufacturing has changed considerably in the six months since Australian Micro's survey of the industry. Tony Smith looks at the changing face of the industry with an investigation of recent successes and failures.**

# **The BIRTH, DEATH and REBIRTH of Australian Microcomputer Manufacturers**

## **■ INFORMATION ELECTRONICS**

BIRTHS have continued to swell the ranks of the infant Australian general-purpose microcomputer manufacturing industry since Australian Micro Computerworld surveyed the scene last October.

But at least one company has died (although its central product lives on), one of the strongest players has retreated into receivership and the only publicly-listed specialist hardware manufacturer has re-emerged from receivership.

Although positioned in a part of the market that pre-dated micros, Information Electronics' fall into receivership and ultimate recovery contain many important lessons for Australia's emerging computer

manufacturers. Given its experience in computer terminal manufacture, combined with the present ease of entry into microcomputer manufacturing, there is every likelihood that the company may play an active role in local computer manufacture.

IE was building computer terminals when that was the boom sub-market of the industry, supplying prestige clients like Ansett Airlines and the Totalizator Agency Boards of NSW and Victoria. But as it ran into the difficulties encountered by every company trying to rapidly grow out of its entrepreneur-driven origins, IE was delivered a major blow from the outside — the abandonment of the Public Service Board's ill-conceived Mandata database project for which

IE was to have been a major supplier.

Through a scheme of arrangement with its creditors, IE continued to trade, quickly re-establishing a positive cash flow. But it was forced to reduce the size and scope of its operations as it was unable to take advantage of opportunities which would have required capital.

The company retained a group of its key people while other staff went on to found much of Canberra's growing electronics industry. Faced with dated technology, IE was given a foundation on which to build its re-emergence through a research contract from the Department of Defence for the development of secure 'Tempest' terminals which allow no detectable radio frequency emission.

With the need to continue normal operation under the scheme of arrangement, IE hired John Exley as



marketing manager in April 1982, and he became its general manager slightly more than a year later. It was apparent to Exley that the company would stay under the scheme "for ever" unless somebody took some initiative.

He tried to arrange a takeover by the surviving staff. While searching for finance for such a move, he met a trio of Sydney-based investors wanting to take their first step into the computer industry and who just happened to have kept an old file on IE.

The deal was done, with the injection of \$1.27 million to clear commitments and provide working capital to redevelop the company, especially to enable it to take advantage of some opportunities which previously had to go begging. The scheme of arrangement was terminated late last year, and IE was relisted on stock exchanges in February.

Having been forced to release its under-utilised Bruce plant to Wang, the unpopular new arrival on the Canberra scene, to meet the offset requirements of Wang's huge contract with the Department of Social Security, IE found itself caught by an acute shortage of commercial rental space in the national capital.

It finally found premises on the outskirts of the Fyshwick industrial area and has spent \$100,000 refurbishing them and replacing outdated test and development equipment. As well as building on its established Tempest market to the Defence Department and its ability to render other suppliers' equipment secure from debugging (a high value-added process), IE was able to announce new initiatives within weeks of its re-emergence.

With the gradual development of some local electronics industry infrastructure, IE has been able to opt out of some manufacturing steps by sub-contracting such activities as PCB manufacture and cabinet metalwork. As a pointer for the future, Exley said the company would increasingly emphasise "information" rather than "electronics", especially on electronic information exchange.



The PortaPak computer from the Portable Computer Co.

## PORTABLE COMPUTER CO.

ONCE in a while, something comes along that has just the right kind of look and feel that it stands out from the crowd. Among the expanding grey crowd of personal computers, one recent addition to the ranks of Australian manufacturers has made a contribution which stands out in both excellence and flair.

If there is any prejudice in this opinion, it is a prejudice built on six years of wanting designers to come up with a product both useful to technical users and built in an attractive, economical package.

At 1983's Australian Personal Computer Exhibition, it seemed that Harry Platt, with his dental software package, and Ivan Stearns, with his interest in graphics, were the only two not caught up in the euphoria. They found no hardware that suited their requirements, so decided to build something for themselves.

At this year's PC show, their modest balcony stand provided the only real excitement (Macintosh apart) with the product they had specified for themselves and an even niftier successor built to justify the trouble they had gone to in establishing The Portable Computer Co.

Having executed the design and tested production and packaging, PCC looked upon PC84 as its market research, placing the cart before the horse in the way most technical people do. The results were something else — 120 retail and vertical market enquiries.

PCC's first product was the PPC-8 luggable five-slot S-100 bus system with 6MHz Z80B processor and I/O, 128K-bytes of RAM, twin 1.2M-byte formatted floppies, and three spare slots for a range of incredulous technical options including a 10MHz 8086 processor board with space for 8087 math and 8089 I/O co-processors, 32-bit internal processing using the newly fashionable NatSemi 16032 as a co-processor to a Z80B, optional Winchester or 5M-byte removable cartridge disks, 512 x 480 pixel monochrome graphics with its own separate processor and 256K-byte RAM boards or additional slave boards similar to the master Z80B board and operating under TurboDOS.

Platt contributed small batch-production expertise he had gained with a company making heart pacemakers, and PPC-8 was produced at about five units a month.

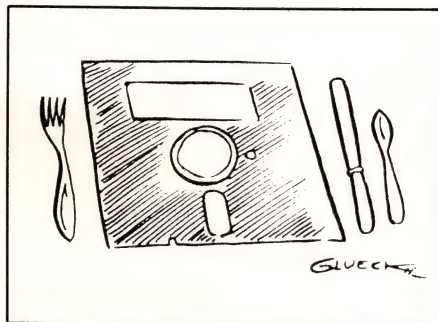


These are sold at minimum configuration for less than \$5000 including tax.

About last September, PCC decided that PPC-8's potential was limited to discerning and specialist buyers. The company noted the demise of Osborne and identified a need for an environmentally tolerant field machine — something that would resemble a battery box. As a result, the specifications gelled for the Porta Pak, a system required to be half the size of, while outperforming, the then emerging dominant transportable Kaypro II.

Porta Pak combines a similar 128K-byte Z80B PPC-8 configuration with Canon slimline 800K-byte formatted drives which can read other 5¼in formats, standard 80 character by 35 line screen, 640 x 304 pixel bit-mapped graphics, and the great understatement: "heavy duty aluminium case in a choice of colors." PPC says everyone they spoke to said multiple bright colors were a definite no for computers, but they went ahead regardless, believing the colors would make the computers a little friendlier. Public and dealer reaction has proven the foolishness of would-be experts, with dealers planning to stock even the less popular of the six colors purely to emphasise the novelty of there being a choice.

Early this year, PCC placed a courageous advertisement in an attempt to secure \$500,000 in venture finance over five months to speed up production. While it failed to secure the money from any of the reputed contenders for MIC licences, it found backers because of contacts made through the advertisement into the closed world of venture capital.



## ■ BGR COMPUTERS

IF EVER there has been an Australian computer manufacturer created as a model of what the conservative business and financial communities say should be done, it is Melbourne start-up company BGR Computers, which has just launched Excalibur 64, its first product.

BGR was conceived in January last year because of a chance meeting between its eventual principals and an independent design company. The BGR team undertook several months' market research which produced specifications for a system to suit the education and small business markets — a disk-based system, because "early computer users were through with tape cassette-based systems".

They identified Microbee as the only Australian success in the low-end market and proceeded to closely parallel key aspects of the Microbee's development. BGR commissioned an independent design company to produce the desired unit, first releasing a diskless kit version through Electronics Australia from last July, originally at \$400.

It was BGR's intention from the outset to manufacture the complete Excalibur system, but it identified two particular problems with the low-end market: the cost of development and the availability of software. Of more than 300 kits sold, BGR claims 250 went into user groups which are now providing a software feedback of games, utilities and educational packages.

The company has been privately financed by its three directors who had backgrounds in marketing-sales-administration, retailing and technical-service-engineering, without resorting to the risky use of advance-purchase payments to fund continuing development. Two directors have abandoned their outside sources of income to work full-time on BGR, with their match-

ing Mercedes in the Brunswick back-street carpark reflecting previous achievements.

Overheads have been kept to a minimum, with an old canvas deck chair being the only seat offered to visitors. Despite the economies, BGR does not expect to be trading in the black before September, by which time those Mercedes may also have to be converted to something more negotiable, or mothballed to save on running costs.

Although Excalibur was not ready to be considered for the recently announced Victorian Education Department preferred-suppliers list, it has already been shown to them in the quest for a position at the next annual review. It is expected that local preference will count heavily in its favor.

The completed Excalibur 64 disk system, which is configured just slightly above the Microbee 64, is one of the few Australian-designed computers not trying to add something substantially innovative to the market. BGR recognises that the Excalibur design is at least half way through its market life, and is not exactly what it would specify if the company was starting now.

As with most newer 8-bit systems, Excalibur is fast. Its built-in color with a programmable character generator for multiple character graphic images are cited as advantages. BGR did not want to be heavily committed to the resale of peripherals, so made Excalibur open for third-party hardware vendors and vertical market applications.

Victorian marketing is done through dealers who have not got IBM, Apple or Tandy and who were looking for product. Interstate marketing is done through sub-distributors, and overseas marketing is targeted at fringe countries rather than major markets. BGR will be happy to secure a percentage of the market segment in which Excalibur's features are applicable.



The well-credentialed trio of businessmen who formed the company saw computers as a way of making money, and saw an opportunity to reach for the sky over the next two years with a more technically advanced "mini-mainframe" positioned well away from Excalibur.

To get complete Excalibur manufacture going, BGR increased the price of the kit form by \$100, thus reducing demand in preparation for

the three months it took to set up the full operation. Board soldering was contracted out. BGR is also looking at non-computer electronic products as insurance against volume drops.

While the directors recognised the risk factors and say they have taken on far more pain and worry than they needed, they could no doubt go back into their original fields if the venture is not successful.

ground to a halt, unable to cope with the problems it was encountering.

Pressure from creditors, most of whom were component suppliers, finally forced the receivers to be called in, just when the one thing that could have rescued the company was about to occur.

SME Systems, a well-established Melbourne circuit board manufacturer and S-100 system assembler, obtained rights to the Aussie Byte board to add to its own range.

Apart from component suppliers, the only real losses were the time and capital put in at start-up by the Arnolds.

The investors have reportedly formed another company to use the SME-built Aussie Byte in products of their own. David Arnold is continuing his association with them while assisting the liquidator to best realise the remaining RDM assets.

Roger Arnold left the company a month before the receivers were called in and married a woman who is supporting him in his apparently successful quest to build a reputation as a designer of specialist boards for other manufacturers.

While RDM's investor knew it was taking on a genuine risk investment, the rest of the company's short life provides a list of lessons of how not to succeed while really trying.

In taking on building complete systems, RDM found "tremendous hassles", especially with component supply, for which it was unprepared. And the investment, when it did come, was a classic case of too little too late.

## RDM COMPUTERS

IN the time it takes most other start-up companies to work out what they are trying to do, one small Melbourne company went from birth to having a product, to building a computer, to liquidation.

RDM Computers was formed as a partnership between brothers Roger and David Arnold to build up other suppliers' kit computers into full systems on which to run business applications.

They soon found that the kits, while useful for hobbyists, did not quite meet the bill as far as serious business requirements were concerned. So they decided that they had to have their own product which would be suitable for business.

Roger Arnold had gained some electronics training with the Army before getting a medical discharge and went on to do several years study to bring those skills up to commercial standard. He had some early industrial design experience with the first microprocessors to hit the market and so keenly took on the project.

The project was financed out of the Arnolds' own limited funds without any outside venture capital, so the operation continued on a shoestring, with David continuing to work elsewhere while Roger produced the design for the Aussie Byte single board computer.

When RDM decided that it had a product worthy of manufacturing, the brothers went to the first Australian Personal Computer Ex-

hibition to test the water. As the first Australian product to offer CP/M 3.0 with its capacity to address the on-board 256K-bytes RAM through bank switching, Aussie Byte was one of the hits of that show.

The response at the PC show introduced a dangerous distraction when users suggested that such a good board should be immediately integrated with a keyboard, screen, disk drives and so on to produce a complete computer.

While RDM had a design capacity, it had no qualifications to be even a board manufacturer, let alone a mass producer of complete computer systems.

The brothers approached the Victorian government's advisory service for small businesses which pointed them to a number of possible private investors, leading eventually to one company which wanted to develop a complete system line. The investor was able to buy its way in with capital injection of only around \$50,000.

The money was quickly spent paying programmers for essential software customising and little of it was used to set up a manufacturing operation.

To make matters worse, the first batch of boards subcontracted out for wave soldering was cooked by the subcontractor so badly that only 60 per cent could be recovered. By comparison, hand assembly produced 90 per cent working boards.

In the end, the company simply





## CMAD

TO the general public, there is little difference between receivership and bankruptcy, but to those caught in the middle with many years of their own hard work at stake, the little space that does exist is a necessary last resort when all else has failed.


One of Australia's pioneering computer companies, CMAD, has placed itself in this unenviable buffer zone, reportedly due to development cost over-runs during the production of its CM2, Motorola 68000-based extension to its established range of mini-computers — the only Australian-designed processors ever to reach the market.

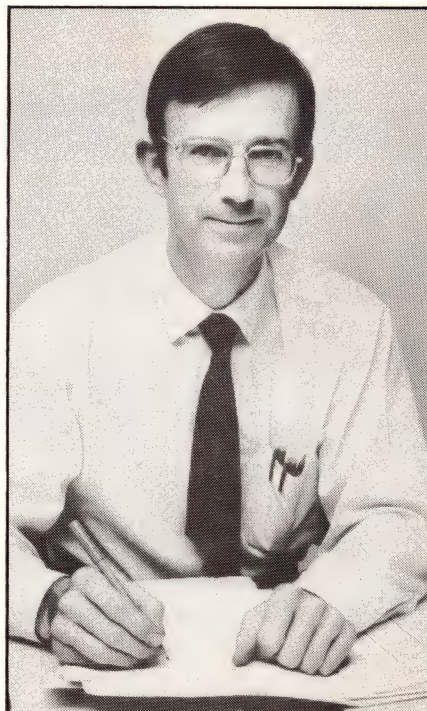
While CMAD has claimed that an MIC-invoked hiatus in the supply of venture capital was the key factor in its problems, it has been well known

in venture capital circles for some time that CMAD was in the market for substantial investment, with reservations often being expressed about its unique technology base.

The company had developed two general-purpose minicomputers from the instruction set upwards, its own system software and a high-volume data entry system. Recent efforts included the design of a 32-bit slice processor.

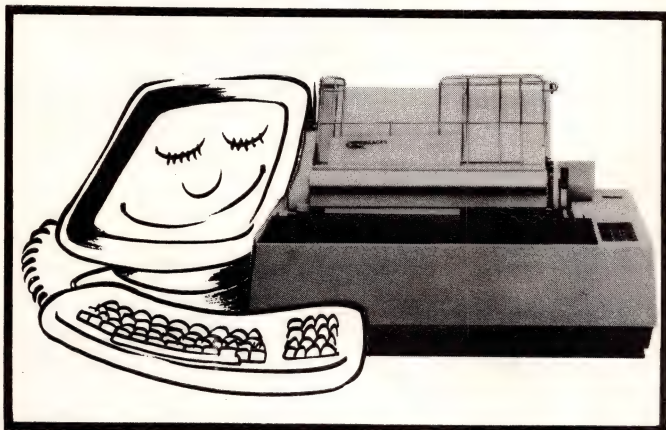
Its present problems may thus be more reasonably assessed as a long-term result of CMAD's proud achievement of some unique Australian technology.

Despite his company's problem's, CMAD's managing director, Damien Dunlop, continues to be one of the driving forces behind ACEMA. 



Managing director Damien Dunlop.

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**Writing for the High Tech Journal, John Ganz has watched the action on the New York stock exchange as personal computer companies go public.**

**He comments on the performance of these companies after the euphoria of the initial stock offering and analyses the MicroPro and Select launches**

# Going Public With a FLOPPY DISK and 30,000 Lines of Code

WHEN we look back to the performance of personal computer companies in 1983, we can see just how weird it all was.

While the Dow Jones Industrial Average 1983 high stood but 25 per cent above the low, personal computer stocks (35 companies) sported a 1983 high 139 per cent above their low. While the Dow's closing price compared to the low was 89 per cent when you compare the 1983 high to the low, personal computer stocks were only 20 per cent along that high-low path.

And that's with about half of the personal computer stocks lacking full year histories — it was that kind of year for new issues.

But then, if you invested early last year before IBM's "goober rumor" collapsed the personal computer stock market, you knew all that. If you didn't, maybe you were lucky and bought in last month.

As for 1983, the only company worth buying was IBM. Or maybe Lotus, which continues to star. Compaq doesn't look too bad either. Ah well, the market knows what it likes.

All-in-all, it was quite a year. Osborne proved that \$100 million start-ups were mortal, and Digital

**Personal Computer Stock Performance in 1983**

Company Systems	1983 High	1983 Low	30/12/83 Price
Altos	32	7 1/4	9 3/4
Apple	63 1/4	17 1/4	24 3/8
Commodore	60 3/8	29 1/4	41 1/2
Compaq	12 1/2	10 7/8	12 1/2
Computer Devices	15 5/8	1/2	1/2
Eagle	24 3/4	7 1/4	7 1/2
Fortune Systems	22 1/2	5 1/4	7
IBM	134 1/4	92 1/4	122
Kaypro	10 3/8	6 1/2	7
Tandy	64 1/2	33 1/4	43 3/8
TeleVideo	40 1/2	13 3/4	15 3/8
Vector Graphic	14	1 7/8	2
Victor Tech	22 1/8	1 7/8	3 3/8
Wicat	20	4 1/4	5
<b>Software</b>			
Ashton-Tate	15	12	12 1/4
BPI	28 3/4	8 3/8	10 1/4
Lotus	31 1/4	22 1/4	31
Select	20 1/2	14 1/4	18
<b>Distribution</b>			
Businessland	10 1/2	9 7/8	10 1/2
Compushop	18 1/8	8 1/4	12
ComputerCraft	11 3/4	7 1/4	8 1/4
Computer Factory	13 3/4	6 3/4	7 1/8
Entre	15 1/4	12	15
<b>Peripherals</b>			
Corvus	22 1/2	7 1/4	8 1/4
Dysan	33 1/2	15 3/4	24
Micropolis	26	9 3/4	10 3/8
MiniScribe	14	9 7/8	10 7/8
Priam	23 3/4	9	10 3/4
Printronix	34	22 1/4	27
Quantum	34 3/4	15 1/2	18 3/4
Seagate	22 1/8	8 1/4	13 3/8
Tandon	35 1/4	14 3/8	20



Equipment proved that multibillion old-timers were, too. The thundering roar of Fortune 500 firms stampeding to the stores to buy trainloads of IBM PCs proved that IBM isn't.

Apple mixed its health-food metaphors by installing a Pepsi generation president, Tandy quietly improved its market position and Zenith snuck up from behind with a \$60 million government order. Drove of venture capitalists cast their bread upon the thin-film and sub-5¼in disk waters, and, as far as we know, are still waiting for the resultant paste to turn to croissant.

1984 should be a good year for personal computer stocks — for those investors who choose wisely. The Fortune 500 market will continue to elude those products without IBM nameplates, but the small-business and home market will prove fertile for the other computer makers. Billions of lines of software code will be sold; communications gizmos will make some entrepreneurs rich.

Out of 23 personal computer-related companies that went public between January 1983 and February 1984, only four have appreciated in value. As a group, the shares have

fallen 32 per cent below their aggregate initial public offering price. Take away the four winners and the losers are down 46 per cent.

Dog-of-the-dance and belle-of-the-ball trophies go to Victor Technologies (woof) and Lotus Development (Ahhh!). Victor, out at \$17.50 a year ago, peaked in a hurry at \$22.50 and then began a dizzying slide into the pits. The company went bankrupt; its stock is now up from a low of \$1.

But who notices. Everyone's got his eye on Lotus. Out at \$18, where many analysts, including this misguided sceptic, thought it was overvalued, the stock closed at \$24 on opening day. It actually hit \$40 last September. The stock is off 25 per cent from its high — perhaps because Symphony lacked the thrust of Beethoven's Fifth — but it's still enough to drag our 23-stock average aftermarket performance up a whole 4 per cent.

The most audacious public offering of 1983 was that of Computer Devices. This wasn't an initial public offering — shares in the company were already traded over the counter — but it's worth mentioning. When the secondary stock issue came out, the company was borrowing to meet

payrolls. Computer Devices is now in Chapter 11 bankruptcy procedures.

Having explained all that, let me make two important points.

More money has been invested, privately as well as publicly, in personal computer stocks in the past 14 months than in the previous five years. This is a watering that should result in eventual bloom.

Historically, over-the-counter stocks have outperformed blue-chip stocks, and the best performance of all has been in the new issues.

Everyone wants a piece of the action when a million seller goes public.

Bitch and moan as its users might do — it's not the friendliest word processing program — about 1.4 million copies of WordStar have been shipped.

The company that sells it, MicroPro International, went public in March with 2½ million shares priced between \$11 and \$13 each.

Founded in 1978 by Seymour Rubinstein, MicroPro has grown steadily, surpassing \$1 million in sales in 1979 and \$50 million in 1983. This year the company could hit the magic \$100 million.

It's not clear from the prospectus how much Rubinstein put into the business, which was converted from its original status as a whole proprietorship, but the first offering to venture capitalists raised about \$½m at \$8.42 a share. Presumably, he put in much less than that; his six million shares were valued at \$0.01 at founding.

He'll walk away from this offering, in which he'll sell 862,516 shares of stock, with \$11 million in cash and stock worth close to \$50 million. (It's a nice cash-out, but the venture-capital and underwriting boys are exacting a price; he'll give up voting control of the company.)

Will MicroPro treat investors as nicely?

By the numbers, the deal doesn't look as weighted to public shareholders as that of Select Information Systems, another one-product, word processing vendor. On the other hand, MicroPro has considerably more resources, experience and distribution. The comparison is

### IPO\* Aftermarket Performance

Company	IPO Date	IPO Price	3/9/84 Price	% Change
Fortune Systems	4/3/83	\$22	\$ 5¼	-74%
TeleVideo	15/3/83	18	11½	-36%
Victor Technologies	23/3/83	17½	1¼	-90%
Computer Factory	5/83	12½	7½	-43%
Priam	2/6/83	17	8	-53%
Micropolis	3/6/83	17	9¼	-46%
Eagle Computer	15/6/83	12	6	-50%
Key Tronic	22/6/83	19½	16¾	-14%
Wicat Systems	30/6/83	18	3¾	-79%
Compushop	7/83	8	9¼	+16%
Computer Craft	2/8/83	9½	7	-26%
PC Telemart	3/8/83	5	1¼	-65%
Kaypro	25/8/83	10	7¾	-22%
Lotus Development	6/10/83	18	30¾	+71%
MiniScribe	3/11/83	11½	5½	-51%
Select Info. Sys.	4/11/83	5	2½	-48%
Ashton-Tate	1/12/83	14	7¾	-45%
Entre Computers	6/12/83	12	17¼	+44%
Compaq	9/12/83	12	8	-33%
BusinessLand	14/12/83	10	9½	- 9%
Math Box	10/1/84	9	11	+22%
Columbia Data	18/1/84	11	8¾	-24%
Ima Comp	19/1/84	11½	8¼	-28%

\* Initial Public Offering.



more for fun than for decision making. At least MicroPro buyers better hope so — Select's share price has dropped 50 per cent since its opening.

MicroPro may actually have more in common financially with Lotus Development — they have roughly the same amount of ownership, and both have products in the top 10 software hit parade. Lotus has more sex appeal, of course, but MicroPro had twice Lotus' revenues and earnings when it went into its share offering.

It gets down to whether or not you believe one-product companies have a future. One might normally say no, but MicroPro has some aces:

Installed base. Secondary products that interface with WordStar, like MailMerge and InfoStar, should add revenues for incremental marketing costs. InfoStar accounts for 14 per cent of MicroPro revenues, WordStar for 74.

User loyalty. The fact that WordStar is not the easiest package to learn and use may be a blessing in disguise. It's the first microcomputer word processing program for most of its users and, after the experience of learning it, many of those millions may not want to learn another.

The market. According to International Data Corporation, sales of microcomputer word processing software will grow by more than 50 per cent a year for most of the decade. WordStar will dominate. No other word processing program is likely to knock it off for a while, and competition from integrated programs that include word processing will chip away, but not devastate, sales.

International distribution. MicroPro's got it — more than 20 per cent of its revenues come from outside the US.

A good investment? Put it this way: the company's finances look better than many a disk-drive manufacturer's. It has established market share, it will have a hefty war chest (\$18 million) after its initial public offering, and its product is stalwart, if not sterling. It's run by businessmen — high-echelon types out of Sperry and IBM — not by programmers. And it's backed by Fred Adler, the venture capitalist who put Data General, Lexidata, Micro D and Daisy Systems on the map.

Whether this turns you on or turns you off, remember: this is the microcomputer market. It's not for the faint of heart.

**m**

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## MicroPro versus Select Information

	MicroPro	Select
<b>Founded</b>	10/78	12/80
<b>Packages Sold</b>	1,400,00	40,000
<b>Fiscal Year 1983 Revenues</b>	\$45M	\$2M
<b>Initial Public Offering (IPO) Date</b>	3/84***	3/11/83
<b>No. Shares Sold</b>	2,500,000	500,000
<b>IPO Price</b>	\$11-\$13	\$5
<b>Price at 6/2/84</b>		\$2½
<b>Raised for Company</b>	\$16M-\$18M	\$2M
<b>IPO Valuation (max)</b>	\$165M	\$3M
<b>Public Owns</b>	20%	50%
<b>Founder Got</b>	\$11M	\$0.1M
<b>Founder Owns</b>	29%	21%
<b>Earnings Per Share Pro Forma</b>	\$0.91*	\$0.47**
<b>IPO P/E</b>	14	11
<b>Valuation/Latest Fourth Quarter Revenues</b>	2.8	1.9
<b>Valuation/1984 Revenue Estimate***</b>	1.6	0.7

\* 4 × latest published 3 month earnings divided by shares outstanding after IPO

\*\* 2 × latest published 6 month earnings divided by shares outstanding after IPO

\*\*\* Tech Street estimates

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# SYSTEMS

## Tandy launch

TANDY Australia has launched the TRS-80 Model 4P transportable micro, a development of the standard TRS-80 Model 4. The Model 4P, which weighs less than 12kg, features 64K-bytes of memory expandable to 128K-bytes, 9in green screen, dual double-density disk drives, numeric keypad and a range of software. It will run Model III disk software as well as standard Model 4 software. Tandy has also released the Model 2000 in the TRS-80 range. Powered by Intel's 80186 microprocessor, the Model 2000 is designed to be IBM PC compatible. It features double-density, double-sided 5¼in disk drives with four times the capacity of the PC.

**Further information:** Tandy Australia Ltd, 91 Kurrajong Ave, Mt Druitt, NSW 2770. Telephone: (02) 675 1222.

Enter T547 on Enquiry Card

## Hartley offering

DAVID Hartley Computer has released a new microcomputer which runs MS-DOS and Hartley's own Hapas software system. The product is designed to allow Hartley access to the lower end of the computing market.

**Further information:** David Hartley Computer Australia Pty Ltd, 89 Jephson St, Toowoong, Qld 4068. Tel: (07) 377 0509.

Enter T548 on Enquiry Card

## 32-bit Universe

INTELEC Data Systems has released a new model Universe computer, called the Universe 68/67T, from CRDS in Australia. The 32-bit system features an 8in 84K-byte Winchester disk unit with a formatted capacity of 64M-bytes, a 45M-byte streaming cart-

ridge tape drive for disk backup and a 12.5MHz processor with a 4K-byte cache. Memory is 5M-bytes expandable to 16M-bytes when the next generation of memory boards are released. Available software includes the Unify Database Management System, LEX-11 word processing and Supercomp-20 spreadsheet packages. Other available hardware includes an Ethernet networking interface, a floating point unit, high-speed graphics controller and an array processor.

**Further information:** Intelec Data Systems, 217 Blackburn Rd, Mt Waverley, Vic 3149. Telephone: (03) 233 1844.

Enter T549 on Enquiry Card

## Sperry fast

SPERRY Computer Systems has released the 16-bit Sperry PC in Australia. Sperry says the machine can run all software designed for the IBM PC and can run 50 per cent faster than either the PC or XT. It is also hardware compatible, able to use all the plug-in cards being developed for the IBM PC. The Sperry PC can run at either 4.77MHz (standard IBM PC speed) or at 7.16MHz, and features 128K-bytes of RAM, expandable to 604K-bytes. Graphics capabilities run to 640 x 400 pixels. The operating system is MS-DOS (version 1.25 for 5¼in floppy disk drive unit and version 2.0 for 10M-byte hard disk unit.) Asynchronous communications interface (incorporated in the main system logic) is offered as standard. Based on the Intel 8088 chip, the machine can emulate an IBM 3270 bisynchronous terminal or a 3270 SNA networking terminal via feature card interfaces. Operating in yet another mode, the machine can be used as an

editing Uniscope terminal communicating with Sperry's 1100 or Series 80 and 90 mainframes. Other features include a 12in green phosphor monitor displaying 25 lines x 80 characters, detachable 84-key keyboard, built-in real-time, battery-backed clock and built-in speaker for musical or sound effect applications. Each display provides a 256 character set including 96 ASCII graphics characters and symbols for word processing and business graphics.

**Further information:** Sperry Computer Systems, 100 Miller St, Nth Sydney 2060. Telephone: (02) 929 7800.

Enter T550 on Enquiry Card

## The Pied Piper

THE Pied Piper MIC 504 system has been released in Australia by Pericomp. Based on the Z80 processor, it features 64K-bytes of RAM, dual 5¼in disk drives, an 80 x 25 video display, two RS232 communications ports and has 2M-bytes of storage. Offline storage can be boosted with an optional 10M-byte Winchester drive. The basic model, bundled with five business software packages, costs \$3150 before tax, or \$4950 before tax for the hard disk version.

**Further information:** Pericomp, 189-193 Kent St, Sydney 2000. Tel: (02) 27 5953.

Enter T551 on Enquiry Card



Pied Piper MIC 504.

## Sanyo spearhead

SANYO Data Systems expects its MCB 550 and 555 series personal computers to spearhead a completely new model range to follow the MCB 1000 and integrated SSS accounting software. Both systems, released recently, are priced to sell for less than \$2000. Both machines have the same configuration, except that the 550 has a single 160K-byte drive while the 555 has dual 5¼in disk drives. Features include an 8088 16-bit processor and 128K-bytes of memory expandable to 256K-bytes. There are 48K-bytes of ROM.

**Further information:** Sanyo Data Systems, 127 Walker St, Nth Sydney 2060. Tel: (02) 929 4644.

Enter T552 on Enquiry Card

## Comprador CAD

COMPRADOR Business Systems has obtained Australian distribution rights for a computer-aided drafting and design system which runs on the IBM PC. Called AutoCAD, the system costs \$2250.

**Further information:** Comprador Business Systems, 90 Warren Rd, Smithfield, NSW 2164. Telephone: (02) 681 4000.

Enter T553 on Enquiry Card

## Wordplex alternative

A WORDPLEX personal computer range compatible with the IBM PC, but more than 12½ per cent cheaper, has been announced. The portable Wordplex costs \$4247, and is available for immediate delivery. Based on the Corona PC, the Wordplex PC's features include 128K-bytes of RAM expandable to 512K-bytes. Options include dual 320K-byte double-density disk drives or the Wordplex PC XT hard disk model which includes a 10M-byte Winchester disk unit.

**Further information:** Wordplex Australia Pty Ltd, 157 Walker St, North Sydney 2060. Telephone: (02) 923 2888.

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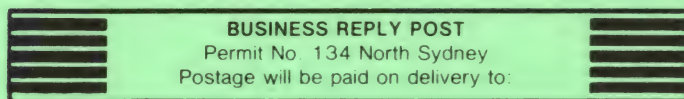
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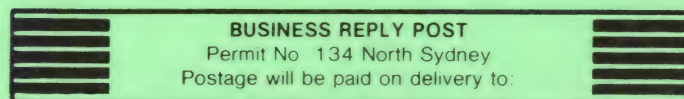
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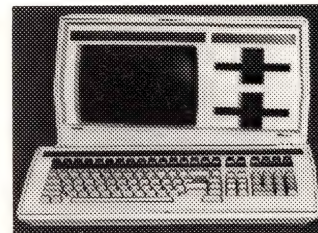
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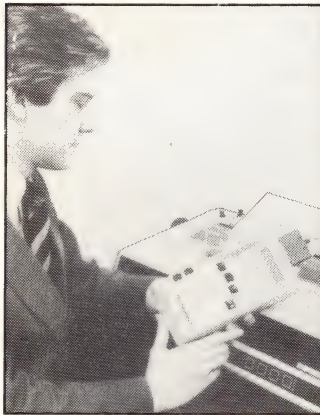
# PERIPHERALS

## Hand-held WP

MICROWRITER, the first hand-held word processor, is available in Australia through PHM Australia. The fingers and thumb of one hand can operate the six keys and the unit. These keys control letters, numbers, punctuation and all commands. Text appears on a 16-char, single-line LCD, and Microwriter has capacity for five A4 pages of type. The unit can be hooked to a monitor for larger displays of text and peripherals can be connected via an RS232C port.

**Further information:** PHM Australia Pty Ltd, Suite 8, 22 Central Ave, Manly, NSW 2095. Tel: (02) 977 6600.

Enter T524 on Enquiry Card



Microwriter hand-held word processor.

## Western CAD

A NEW series of Westward Graphics terminals, designed specifically for CAD/CAM activities, is being released in Australia by Insystems Pty Ltd. The 19in screens offer up to 2048 x 1658 resolution, and high display speeds. The Westward Graphics Manager hardware option provides powerful intelligence for complex 2D and 3D image processing.

**Further information:** Insystems, 337 Moray Street, Sth Melbourne, Vic 3205. Tel: (03) 690 2899.

Enter T525 on Enquiry Card

## Topnet networking

TOPOLOGY Networking has announced the Topnet Networking Modules, a family of hardware and software products designed to handle a wide range of communications requirements for microcomputers in mainframe-based networks. The cornerstone of the range is the Topnet Board, an intelligent communications controller that runs as an expansion

board in an IBM PC. Versions for other personal computers are being developed. Offered with the Topnet Board is an auto-dial 1200 bits/sec synchronous modem and software modules encompassing SNA/SDLC and BSC communications for both interactivity use and batch file transfer operations. With its own 8088 microprocessor, 128K-bytes of RAM, real-time clock, and two serial ports, the Topnet Board effectively doubles the power of the PC by running its own software independently of the PC's main processor. Perhaps more significantly, the co-processor concept allows the Topnet Board to maintain a communications session in background regardless of the application running on the personal computer.

**Further information:** Topology Networking Pty Ltd, 700 Burke Rd, Camberwell, Vic 3124. Tel: (03) 813 3377.

Enter T526 on Enquiry Card

## Testing range

KINETIC Systems has released a range of equipment manufactured by Wilson Laboratories of the US. The range includes the MWX-1000 Winchester drive tester and the MFX-500 floppy drive analyser. The MWX-1000 allows testing of drives with ST506 and SA1000 interfaces and provides margin testing with either 2 or 1 n/sec resolution, variable head-stepping rates, media formatting and verification, rotational timing and step timing. The analyser is adaptable to all configurations: 5¼in or 8in, multiple heads, 4.34 or 5MHz data transfer rates, cylinder numbers and write precompensation settings. The MFX-500 is a universal tester which works with all major floppy disk drives. Other products in the range include: DTS-1000 Four drive Winchester Test Station, MPX-1000 Printer Terminal Analyser, SX-530 Disk Memory Analyser HAT-500 Head Alignment Tester, TFX-500 Tape Formatter Tester, DX-500 Cartridge Disk Tester, CX-500 Communications Tester.

**Further information:** Kinetic Systems Pty Ltd, 357 Nicholson St, Carlton Nth, Vic 3054. Telephone: (03) 347 7326.

Enter T527 on Enquiry Card

## Multiplexers push

THE sale of more than \$1 million worth of multiplexers to the US last year has prompted Webster Computer Corp to launch a second board level product in a range of three sizes. The com-

pany will market the new board independently of its Spectrum Eleven minicomputer range. Initial sales promotions will be concentrated in Australia and the USA, highlighting certain technological innovations the combination of which Webster believes to be a first ever in the DEC (Digital Equipment Corporation) and DEC-compatible world. Memory sizes come in 256K-bytes, 512K-bytes and 1M-byte, and the boards are designed for DEC or DEC-compatible Qbus systems such as 1123 and 11/73 machines. The boards, all high-density MOS dynamic memory modules, will be known as the SMSV11 range and are designated as model SMSV11-P4 (256K-bytes), SMSV11-P5 (512K-bytes) and SMSV11-P6 (1M-byte).

**Further information:** Webster Computer Corp Pty Ltd, 17 Malvern St, Bayswater, Vic 3153. Tel: (03) 729 8444.

Enter T528 on Enquiry Card

## School switch

THE Vic-Switch, a multi-user system which can connect up to eight Commodore 64 or Vic 20 computers (or a mixture of the two types), has been released by Commodore Business Machines. Designed specifically for school use, the Vic-Switch can connect the CPUs to a printer or disk drive simultaneously.

**Further information:** Commodore Business Machines Pty Ltd, 5 Orion St, Lane Cove, NSW 2066. Tel: (02) 427 4888.

Enter T529 on Enquiry Card

## Power supply

SCIENTIFIC Electronics has released details of its newest power supply, the SM45AD1. Designed and manufactured by Scientific Electronics, the SM45AD1 has four output rails from which a total of 45 watts can be drawn. This new switch mode supply meets Telecom specification 1302 and offers high reliability and efficiency in a compact package, making it ideal for a wide range of computer applications. Output rails to customer specifications are also available. Standard outputs are: +5V at 4A continuous, +12V at 1.5A continuous 3 Amp peak for 10 Sec, -12V at 0.5A

continuous and -5V at 0.1A continuous. All outputs are short circuit protected and the +5V and +12V outputs have overvoltage protection. Total allowable output power is 45 watts continuous — 63 watts peak. Isolation is greater than 3.5kV and efficiency greater than 70 per cent at full load. The SM45AD1 measures 85 x 254 x 60mm and, as with all other power supplies from Scientific Electronic, is fully supported by a five-year warranty and complete local technical back-up.

**Further information:** Scientific Electronics, 6 Holloway Dr, Bayswater, Vic. Tel: (03) 762 5777.

Enter T530 on Enquiry Card

## Graphics card

SOURCEWARE has introduced a high-resolution graphics card for the IBM PC. The Hercules Graphics Card is the only monochrome graphics card chosen by Lotus Development Corp to support Lotus 1-2-3. The Hercules card costs \$795 and is supported with programs for business graphics, drafting, word processing and computer-aided design. It is compatible with IBM's advanced Basic graphics features and a library of graphics sub-routines.

**Further information:** Sourceware Pty Ltd, 4/73 Albert Ave, Chatswood, NSW 2067. Telephone: (02) 411 5711.

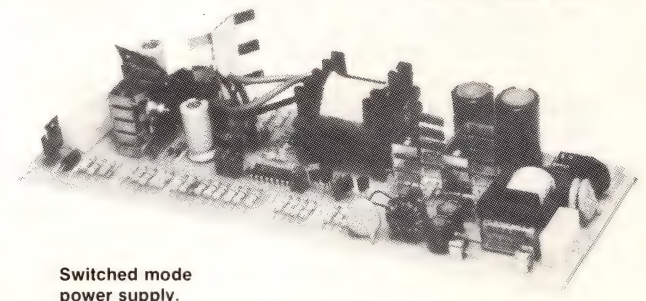
Enter T531 on Enquiry Card

## Printer interface

IMPACT Systems has announced a new Wang printer interface capable of supporting 200 lines/min to 1200 lines/min printers on the Wang VS computers. The printers are plug-compatible with all Wang VS computers from the VS25 through to the VS100. The interface connects to Wang's serial coax cables from the Wang CPUs. The interface is microprocessor driven and enables Impact Systems' broad line of printer products to emulate Wang's 5573, 5574 and 5575 printers. Prices are \$10,250 (400 lines/min), \$11,700 (700 lines/min), \$13,700 (900 lines/min) and \$29,800 (1250 lines/min).

**Further information:** Impact Systems Pty Ltd, 3 Male St, Brighton, Vic 3186. Tel: (03) 592 4066.

Enter T532 on Enquiry Card



Switched mode power supply.





Silver Reed  
EXP500  
daisywheel printer

### Silver Reed printers

TWO Silver Reed daisywheel printers, the EXP500 and the 770, have been released by Pacesetter Peripherals. The EXP500, which costs \$734 before tax, can produce copy at 17 char/sec. It interfaces with most word processors and personal computers via Centronics and RS232 serial interfaces. A bi-directional forms tractor feed is optional. The 770, also compatible with most word processors and personal computers, features variable pitch and line spacing; double, triple and shadow multi-striking with underline and can print super-script and sub-script characters. The 770 can also print proportionally.

**Further information:** Pacesetter Peripherals, 16 Dickson Ave, Artarmon, NSW 2064. Telephone: (02) 439 4655.

Enter T533 on Enquiry Card

### Tektronix mixer

TEKTRONIX has released its RGB Mixer which allows terminals that do not provide composite video signals, such as IBM's Model 3279, to interface with Tektronix 4600 series monochrome copiers. The RGB Mixer mixes red, green, blue and synch signals from a color video source into the composite video information necessary to operate a monochrome video copier such as the Tektronix 4632 or 4635.

**Further information:** Tektronix Australia Pty Ltd, 80 Waterloo Rd, Nth Ryde, NSW 2113. Telephone: (02) 888 7066.

Enter T534 on Enquiry Card

### Hospital boards

HOSPITAL Computers has released the ADD RAM PLUS and the ADD RAM ELITE boards from Profit Systems. Either occupies one slot on the IBM PC, XT or compatible computers. Both have up to 512K-bytes with parity on the one board (no piggyback). They have clock/calendar and two serial ports or one serial and one parallel respectively. Also included is Ramdisk and Ram-spooling capabilities and a multi-

tasking function allowing up to nine tasks to run concurrently. All software is included in the price of the hardware board.

**Further information:** Hospital Computers, 86 Kareena Rd, Miranda, NSW 2228. Telephone: (02) 526 9101.

Enter T535 on Enquiry Card

### Workslate date

WORKSLATE, an integrated business tool, will be released in Australia in May by Sigma Data. The 21.6cm x 28.5cm x 2.5cm device is driven by Hitachi's 6303 CMOS microprocessor, has a 16-line x 46 char LCD, which is a window on a much larger worksheet display area, and 60 keys. The device has 64K-bytes of ROM, 16K-bytes of RAM, 330 bits/sec modem with auto-answer auto-dial, microphone, speaker and a microcassette recorder for voice and data. Software in ROM includes the operating system, electronic worksheet list, time and data management and communications functions. Users can create budgets, forecasts, financial models, cost estimates and expense reports. An optional printer is available, and WorkSlate's RS232C and Centronics ports allow daisywheel or dot-matrix printers to be attached.

**Further information:** Sigma Data Corp, 157 Walker St, North Sydney 2060. Tel: (02) 436 3777.

Enter T536 on Enquiry Card

### Formatted packs

NASHUA Australia has available formatted packs for the ICL 80M-byte disk drives on its ME29 and System 25 computers. The pack is compatible with the EDS80, and in both cases is error-free for the system it is used on. The plastics have been changed to incorporate the Volcano-style top cover with the bottom cover now clipping on rather than screwed on.

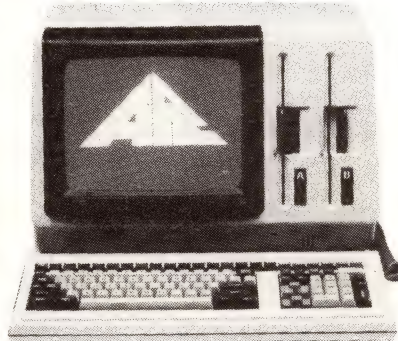
**Further information:** Nashua Australia Pty Ltd, 34 Chandos St, St Leonards, NSW 2065. Tel: (02) 925 3111.

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Enter T033 on Enquiry Card



# SOFTWARE

## MultiMate dictionary

AN 83,000-word Australian/British dictionary has been added to SCA's word processor MultiMate in Version 3.21, now being shipped to dealers. Designed to emulate the Wang word processor, MultiMate performs more than 100 word processing functions, almost all being accessible by one or two keystrokes. The spell-check function in MultiMate breaks words down according to their phonetic structure. The first character of every mis-spelled word is then flagged, and starts to flash. The mis-spelled word is not only flagged, but the user is given as many as nine alternative spellings for that word. The position of Software Corp of Australia as sole Australian distributor of MultiMate was further cemented with the signing of an exclusive distribution agreement last month.

**Further information:** SCA Software Corp of Aust Pty Ltd, 449 Swanston St, Melbourne 3000. Tel: (03) 347 7011.

**Enter T500 on Enquiry Card**

## Micro modeller

COMPUTER Accounting Services has announced Micro-FCS, a financial modelling system for microcomputers. Micro-FCS is the micro version of FCS-EPS, the company's time-sharing financial modeller for mainframe users. Micro-FCS is also available on a time-sharing basis.

**Further information:** Computer Accounting Services, 73 Parramatta Rd, Camperdown, NSW 2050. Tel: (02) 517 0111.

**Enter T501 on Enquiry Card**

## Janus/Ada Compiler

THE Janus/Ada compiler and Modula-2 programming language are available from Ada Australia. The Janus/Ada implementation includes features like true modular programming, full error messages in English, walk-backs and re-entrant initialised variables. The compiler package comes with the Janus/Ada Linker, example programs and the source code for the run-time libraries. Full documentation is included. A tool set for program development is available. These include assemblers, disassemblers, a syntax checker, performance tools, and a Pascal-to-Ada translator. The Janus/Ada compiler and assembler produce relocatable code files. The linker combines these into target machine code

files. All code produced by the compiler is ROMable and re-entrant. Code generators are available for 8080, Z80 and 8086/8088 CPUs with full 8087 support. The Modula-2 system consists of a one-pass compiler, library manager utility, and a module library. Standard library modules provide I/O, program execution, storage allocation, strings, math functions, and decimal arithmetic. Systems supported are Apple II and III, IBM PC, Sage II and IV, UCSD II.0 and IV.0. Programs compile into P-code or native code depending on the host system. Also available is ASE, a text editor suitable for word processing and programming environments.

**Further information:** Ada Australia, 11 Blackmore St, Windsor, Qld 4006. Tel: (07) 57 6999.

**Enter T502 on Enquiry Card**

## More People

OLYMPIA has expanded the range of word processing packages available for its People microcomputer by introducing Trendtext/2, menu-driven, document-oriented package, designed for ease of use in general office environments. Trendtext/2 retails for \$495 and is available in CP/M-86 and MS-DOS 2.0. Features include the ability to display text on the screen exactly as it will appear when printed; the facility to select mail-merge variables such as names and addresses by nominated criteria; the automatic generation of tables of contents and indexes; and efficient cursor movement by character, word, line, sentence or paragraph.

**Further information:** Olympia (Aust) Pty Ltd, 59-61 Dickson Ave, Artarmon, NSW 2064. Tel: (02) 439 3444.

**Enter T503 on Enquiry Card**

## Knowledgeman

MICRO Data Base Systems has released Knowledgeman, a 16-bit integrated data manager with features including: data management, ad hoc enquiries, spreadsheet analysis, screen management, printed forms management and functions and procedures. Knowledgeman needs 192K-bytes of RAM and two 500K-byte disks to operate. Operating system can be either MS-DOS or CP/M-86.

**Further information:** Micro Data Base Systems Inc, 178 High St, Prahran, Vic 3181. Telephone: (03) 529 6372.

**Enter T504 on Enquiry Card**

## Wang Micro-FCS

EPS Software Consultants has announced that Micro-FCS running under MS-DOS is available on the Wang PC. Written in C language, it requires only 192K-bytes of memory and two floppy disk drives as a minimum configuration. Micro-FCS is a compatible subset of the mainframe version, FCS-EPS, available on the Wang VS range.

**Further information:** EPS Software Consultants Pty Ltd, 84-86 Pacific Highway, St Leonards, NSW 2065. Tel: (02) 439 3722.

**Enter T505 on Enquiry Card**

## Basic/Z compiler

A NEW version of the Basic/Z compiler by System/Z Inc has been announced. It is designed to replace the single-user product and is compatible with many operating systems, including CP/M, CP/M Plus, MP/M II, CP/M-86/80, Vector Extended CP/M and Turbo-DOS. Basic/Z supports cursor positioning screen attributes, input masking and screen-oriented editing of console input at run-time. Added features include alphanumeric labels, BCD math to eliminate "round off" errors, program definable precision up to 18 digits, a built-in SORT verb, recursive multi-line user defined functions, and a program editor that tests syntax as you type. Basic/Z costs \$495.

**Further information:** Software Source Pty Ltd, 89 Oxford St, Bondi Junction, NSW 2022. Tel: (02) 389 6388.

**Enter T506 on Enquiry Card**

## List Management

LIST Management, a database management system for the Wang OIS and VS ranges, is being distributed and supported by Datasolve. List management offers simultaneous share access to all files, integration with word processing, data security, data validation on input, calculation utilities and direct access to any record in the database by key names. The system also features statistics and audit trails, help screens, a compress-file option, and hot printing.

**Further information:** Datasolve Pty Ltd, 92 Pitt St, Sydney 2000 NSW. Tel: (02) 232 6328.

**Enter T507 on Enquiry Card**

## Electronic Webster

SPELLBINDER Ver 5.30 is available in Australia through Software Source. Spellbinder, by Lexisoft Inc, now includes the Electronic Webster spelling and grammar checker. Spellbinder's manual has also been rewritten to include

the new features which include footnoting, augmented forms handling and enhanced onscreen four-function calculator. Spellbinder also interfaces with database managers, spreadsheet and accounting software.

**Further information:** Software Source Pty Ltd, 89 Oxford St, Bondi Junction, NSW 2022. Tel: (02) 389 6388.

**Enter T508 on Enquiry Card**

## Small Sage

SAGE, a suite of programs designed to enable software development for a variety of applications, has been rewritten for 8-bit micros. The two main programs are Sage, a file retrieval and update program with which the user can process and store data in keyed files which are indexed on specific fields, and Sagerep, a report generator by which printed reports may be formatted from the data files.

**Further information:** Prest Computers, 5 Empire Crt, Carlingford, NSW 2118. Tel: (02) 683 1557.

**Enter T509 on Enquiry Card**

## Word processor

CO.WORKER has released the Palantir word processor designed to run on most 8- and 16-bit microcomputers with cursor-addressable screens, 56K-bytes of RAM, MS-DOS, CP/M or TurboDOS operating system. The package supports a wide range of printers.

**Further information:** Co.Worker, 3A/18 Milford St, East Victoria Park, WA 6101. Tel: (09) 362 4885.

**Enter T592 on Enquiry Card**

## Tandy languages

TANDY Australia has introduced two new programming languages and an inventory control system for the TRS-80 and two new software packages called PFS: File PFS: Report. The programming languages, OS-9 disk operating system and Basic-09 operate on the 64K-byte extended color TRS-80. OS-9 is a real-time operating system that accesses the entire memory of the computer, while Basic-09 is an enhanced version of Basic written for the 6809 microprocessor. OS-9 costs \$99.95 and Basic-09 cost \$149.95. The Inventory Control System, designed for the TRS-80 Model 16 with hard disk, handles cycle counting, ordering, partial receipts and allows custom-designed reports. It costs \$599. PFS: File and PFS: Report are designed to work with a wide variety of file and report generation tasks. They cost \$179.95 and \$149.95 respectively.

**Further information:** Tandy Australia Ltd, 91 Kurrajong Ave, Mt Druitt, NSW. 2770. Tel: (02) 675 1222.

**Enter T593 on Enquiry Card**



## Fuseable CAD

WARBURTON Franki announce that Data I/O has released the first CAD software package that will compile fuse maps for all programmable logic devices in a common syntax and will enable designers to create source files using any combination of Boolean equations, truth tables or stated diagrams. ABEL — Advanced Boolean Expression Language, supersedes the first-generation PALASM (for PAL devices) and Signetics H&L (for IFL devices) with a standard language logic with either type of device (or with PROMs).

Three versions of ABEL will be initially available: for the IBM Personal Computer (MS-DOS operating system), and for the Dec VAX (VMS and Unix operating systems).

ABEL is written in the C programming language. The popularity of the C language ensures that ABEL can be transported to most machines and operating systems.

**Further information:** Warburton Franki, 7 Birnie Ave, Lidcombe, NSW, 2141. Tel: (02) 648 1711.

**Enter T594 on Enquiry Card**

## Unix additions

ISLAND Software has released four packages which are compatible with IBM PCs and multi-user micros running AT&T's Unix. They are Informix, the Unix-based relational database management system, the XDB (Extended Database System) applications generator, the Phact database record manager — an inexpensive library of C language functions — and Omnibase, a high-level programming language compatible with the SAS (Statistical Analysis System) mainframe package.

**Further information:** Island Software, 32 Heeley St, Paddington, NSW, 2021. Tel: (02) 33 5806.

**Enter T595 on Enquiry Card**

## Low-cost Autocad

MCS Microcomputer Systems Pty Ltd has introduced Autocad, a low cost computer-aided design and drafting system (CAD) to the Australian architectural/engineering industry. Autocad is a two-dimensional system running on low-cost microcomputers, suitable for a wide variety of applications, including architectural, mechanical, electrical, hydraulics, structural and civil engineering disciplines. It can create user-defined screen menus via ordinary text files, and define parts libraries by drawing them. Drawings are created and edited using a light pen or mouse and onscreen menus from existing paper drawings via a digitising tablet, through commands entered on the keyboard, or by any combination of these. Editing commands allow

drawn objects to be moved, copied, modified, erased, rotated and scaled vertically and horizontally. Repetitive patterns such as brick walls or memory arrays can be generated automatically. A full bi-directional zoom facility allows working on the drawing at any level of detail. The programs maintain data internally in full floating-point format, allowing a ratio of at least a million to one between largest and smallest objects. Objects may be aligned to grid boundaries and lines may be forced to run vertically and horizontally only. A high-precision plotter gives fast output of drawings to any desired scale, with a resolution of 0.025mm on either paper or transparent film. Each drawing color may be assigned to a plotter pen and line type. Utilities supplied with the package can convert drawings to or from an ASCII text file. One system, bought by building consultant Carrington, Dalgairns & Associates cost \$25,000.

**Further information:** MCS Microcomputer Systems, 502 Miller St, Cammeray 2062. Tel: (02) 923 1137.

**Enter T596 on Enquiry Card**

## CP/M-80 emulators

JDT Systems has developed software tools and utilities for use with CP/M-86. MS-DOS and stand-alone ROM-based systems that include the CP/M-80 emulators EM-80.CMD or EMZ80.CMD, allowing full use of system-independent CP/M-80 programs for both 8080 and Z80 code under CP/M-86. All CP/M-80 system calls (Bdos and Bios) are trapped and are run directly by CP/M-86. No additional hardware is required other than a minimum of 128K-bytes of memory. Various public domain CP/M programs are also included, including the RT11 file exchange program for 8in floppy systems like the Nec APC.

**Further information:** JDT Systems PO Box 431, Ringwood, Vic, 3134. Tel: (03) 725 0144.

**Enter T599 on Enquiry Card**

## Olivetti Software

EIGHT new applications packages from independent software houses in the USA will soon be available for the Olivetti M10 portable personal computer. Scheduled for release through May to July, the probable prices will range from around \$60 to under \$100.

The first of the new software, to be released in May, is a tutor package from PCSG. It is a typing training program that bases teaching exercises on a series of games. The last of the eight packages to arrive — a mini multiplan from Microsoft — will be available in ROM at the end of July and will offer 63 columns by 94 rows.

A communications package that gives the M10 the ability to access the floppy disk units of a desktop computer will be available in June.

All the programs, with the exception of the "mini multiplan", are on cassette and come packaged in a soft plastic box which contains the cassette or ROM and a manual.

**Further information:** Olivetti, 140 William Street, Sydney, NSW, 2011. Tel: (02) 358 2655.

**Enter T597 on Enquiry Card**

## Multi-user Unix

INTERNATIONAL Data Services in the US and ATAC Software (NSW) in Australasia are to offer an implementation of Unix System III for the IBM PC and XT, giving the PC a multi-user capability not expected to be available under IBM's own Unix implementation. The IDS/ATAC software includes shell, more and vi. It also features a further shell to the Bourne and C shells: a PC-shell which emulates PC-DOS, allowing PC-DOS programs to run from the Unix environment, and facilitating the upward migration to Unix for users having quantities of existing software for the PC. The PC-shell will support PC-DOS commands such as DIR, COPY, ERASE, DEC and REN. The software includes the Unix utility UUCP, allowing an

IBM PC to act as an intelligent Unix workstation with Unix to Unix host communications.

**Further information:** International Data Services, 55 Lavender St, Milsons Point, NSW, 2061. Tel: (02) 436 2477.

**Enter T598 on Enquiry Card**

## Critical path

JAFCO Computer Systems Pty Ltd has released the PROTRAK Project Management System for microcomputers. This Australian developed product offers many features of project control normally available in large mainframe systems. Protrak has been designed to assist the project manager in planning activities, developing the critical path, forecasting completions and costs and tracking progress in order to meet deadlines and budgets. Standard reports are provided for activity status, time and cost analysis and predecessor/successor relationships. Protrak is available for most micros with MS-DOS or CP/M 2.2 operating system including IBM PC, Apple II/e, Dec Rainbow, HP 150, Wang PC, Sirius and AWA Corona.

**Further information:** JAFCO Computer Systems, 133 Alexander St, Crows Nest 2065. Tel: (02) 439 5488.

## Announcing Direct Connect MICRO-MODEM II Improved user friendly version of the Micro-Modem

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# MICROWARE

## Rural Tandy

TANDY Australia's agricultural computer marketing division has released the TRS-80 Agricultural and Horticultural Software Sourcebook. Tandy's agricultural computer marketing co-ordinator, Lyall Jones, states that "the Sourcebook will not only benefit existing rural TRS-80 computer users, but will be of great assistance to anyone considering employing computers in any rural-based business." The 72-page Sourcebook contains detailed descriptions of 63 different software programs and program templates, covering all facets of most rural industries.

**Further information:** Tandy Australia, 91 Kurrangong Ave, Mt Druitt, NSW 2770. Tel: (02) 675 1222.

**Enter T510 on Enquiry Card**

## OECD on privacy

A REPORT called An Exploration of Legal Issues in Information and Communication Technologies has been published by the Organisation for Economic Co-operation and Development. It is available through the ANZ Book Co. The report includes a discussion of the OECD's guidelines on the protection of privacy and trans-border flows of personal data.

**Further information:** Australian and New Zealand Book Co Pty Ltd, 10 Aquatic Drive, Frenchs Forest, NSW 2086. Telephone: (02) 452 4411.

**Enter T511 on Enquiry Card**

## Pascal/Ada journal

THE Journal of Pascal and Ada is a new bi-monthly computer applications journal serving people with specific interest in Pascal, Modula-2, and Ada. The journal will publish articles on graphics, design methods, human engineering, operating systems, concurrency, and advanced tutorial subjects. In addition, subscribers are offered discounts on various software packages. Two packages to be offered will be the Janus/Ada compiler from RR Software and the range of Modula-2 compilers from Volition Systems.

**Further information:** Ada Australia, 11 Blackmore St, Windsor, Qld 4006. Tel: (07) 57 6999.

**Enter T512 on Enquiry Card**

## Pro-log bus box

PRO-LOG's new plastic STD bus card box now features a power supply complete with cooling fan. The Model 721 STD Bus

Box holds up to 13 STD bus cards on 5/8in centres and can accommodate two 5 1/4in or microfloppy (under 4in) disk drives in unused card space. The self-contained power supply meets the requirements of nearly any combination of circuit boards and drives selected by the user. The power supply can also be bought as an optional extra for existing Pro-Log STD Bus Boxes.

**Further information:** Pro-Log (Australia) Pty Ltd, 69 Canterbury Rd, East Camberwell, Vic 3126. Tel: (03) 836 3533.

**Enter T513 on Enquiry Card**

## Graphics service

COMPUTER Images has introduced Simplislide — a low-cost high-quality business graphic service. Computer Images has identified 221 commonly used graphic layouts in slide presentations and made them available in the form of a "fill-in-the-blanks" preparation guide. The presenter selects the relevant master layout for each slide from the Guide, fills in the blanks and sends an order to Computer Images.

**Further information:** Computer Images Pty Ltd, 385 Pacific Highway, Crows Nest, NSW 2065. Tel: (02) 922 7044.

**Enter T514 on Enquiry Card**

## Micro screen filter

TECHNICAL Imports Australia has released a range of Ordi-flex mesh-type screen filters to suit most popular small computers. The new range will fit Osborne 1, Kaga, Kaypro II, Apple, Tandy, Digital, ICL, Olivetti, PET, Zenith, Dick Smith, Sanyo and the IBM PC. The black matrix filter is constructed of nylon micro-monofilament fibres woven to give a columnating grid pattern and is claimed to reduce surface glare by 95-100% and reflected glare by 87-90% of sunlight and fluorescent lights. All components of the Ordi-Flex filter carry UL certification numbers UL 94 VO and UL 478 office equipment specifications. The Ordi-flex filters are available in a variety of styles, sizes, and choice of mesh densities to suit more than 100 brands and models of CRTs. Prices start from \$20, with the average 12in screen filter costing around \$50.

**Further information:** Technical Imports Australia, PO Box 176, Crows Nest, NSW 2065. Tel: (02) 922 6833.

**Enter T515 on Enquiry Card**

## Tektronix catalogue

THE 1984 Tektronix catalogue includes more than 400 products. Photographs of almost every piece of equipment are combined with technical descriptions. The catalogue is organised into four sections reflecting the divisions of Tektronix: design automation, information display, communications, instruments. The design automation division offers a full line of tools to support the design of microprocessor-based systems. The information display division presents computer graphics equipment which quickly translates computed data into understood visual forms. For statistical mapping, mechanical design or business graphing, Tektronix provides monochrome design and color displays, desktop computers, copiers, plotters, software and peripherals to answer the graphics needs of scientists, engineers and businessmen. The communications division provides products designed to test, measure and monitor television, RF and audio electronic signals. The instrument division provides instruments which generate, acquire and analyse electronic events.

**Further information:** Tektronix Australia Pty Ltd, 80 Waterloo Rd, Nth Ryde, NSW 2113. Telephone: (02) 888 7066.

**Enter T516 on Enquiry Card**

## New floppy pack

ESSELTE Dymo Australia has launched its range of floppy disks, in 8in and 5 1/4in sizes, and in single and double-density formats. To enable the stationery dealer to satisfy the growing demand for these products through stationery outlets, the standard packaging of the disks has been reduced to five and two per pack, and the packs themselves are in vivid blue and red,

designed to be eye-catching. Each disk is certified and has been quality-control tested.

**Further information:** Esselte Dymo Pty Ltd, 52-60 Ashford Ave, Milperra, NSW 2214. Telephone (02) 771 6888.

**Enter T517 on Enquiry Card**

## Micro robot

TOPO is a new "Androbot" that weighs a mere 15 kilos and stands about 90cm tall. It is powered by two rechargeable Gel electrolyte batteries and is programmable through a computer. Topo is commanded by either keyboard or joystick, and the drive system, Andromotion, enables Topo to move with maximum stability.

**Further information:** Futuretronics Australia Pty Ltd, 147 McEvoy St, Alexandria, NSW 2015. Tel: (02) 517 2300.

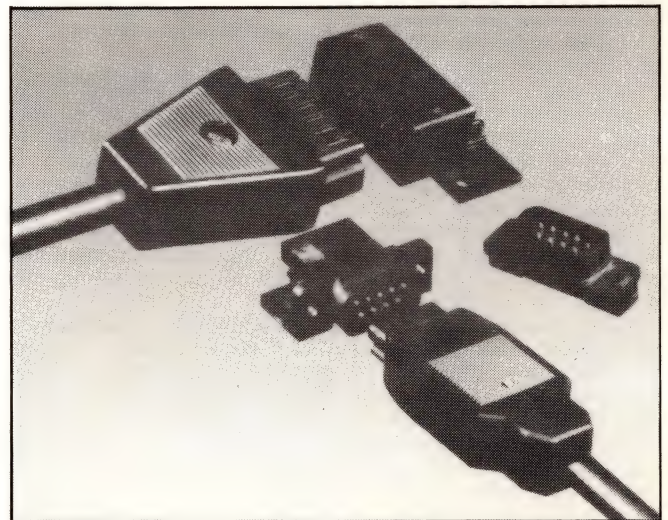
**Enter T518 on Enquiry Card**

## D-Sub connectors

MOLEX has released a range of wire-to-board soft shell D-Sub connectors. The range includes connector housings, headers and backshells of 94 V-2 nylon, as locking and non-locking components in circuit sizes 9, 13, and 15. Crimp terminals are tin-plated phosphor bronze, while header pins are tin-plated brass of 1.02mm diameter with 0.64mm square solder tails. Current rating is 1 amp at 5 volts and contact resistance is 25 milliohms maximum initial. The connectors, crimp terminals, backshells and headers can be ordered separately, depending on requirements. The new components are distributed in Australia by Utilux Pty Limited.

**Further information:** Utilux Pty Limited, 14 Commercial Rd, Kingsgrove, NSW 2208. Tel: (02) 50 0155.

**Enter T519 on Enquiry Card**



Molex D-Sub connectors from Utilux.



## Voca facsimile

THE Voca-Dex 3200, a new facsimile system, has been launched by Voca Communications. The desktop system is software-based and is able to produce hard-copy evidence which is transmitted from the recipient to the transmitting station to indicate proof of delivery in readable condition. Capable of operating unattended, the new system can be stack loaded with up to 30 pages of original documentation up to 11in wide.

Overseas original documents are proportionately reduced to A4 size at the receiving end. Capable of automatically compensating for various colored background documents, the 3200 will also poll, cut and stack each page received to the exact size of the original.

**Further information:** Voca Communications Pty Ltd, 216-222 City Rd, Sth Melbourne 3265. Tel: (03) 62 5071.

Enter T520 on Enquiry Card

## STC service

STANDARD Telephone & Cables is offering a third-party maintenance service for microcomputers. STC offers four basic options: on-site maintenance costing around

10-11 per cent of the system's retail price per year and offering four-hour service; return-to-workshop maintenance costing 7-8 per cent of the system retail price, but the customer must send or deliver the equipment to one of the State capital workshops for service; retail plan maintenance under which the customer pays an up-front 3 per cent of the system retail price and is guaranteed that he won't have to pay more than eight hours worth of labor for repairs in any one year; time and material maintenance, where time and materials will be charged at market rates.

**Further information:** STC, 252 Botany Rd, Alexandria, NSW 2015. Tel: (02) 699 0044.

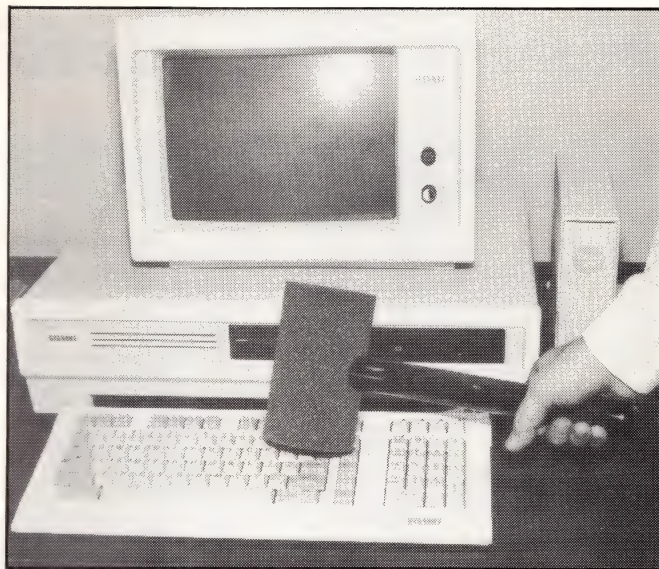
Enter T521 on Enquiry Card

## Clean floppies

RICHARD Foot Pty Ltd is the Australian agent and distributor for the automation facilities range of computer cleaning products. These products include disk drive head cleaning disks, antistatic cleaners, tape drive and cassette head cleaners and VDU cleaners.

**Further information:** Richard Foot Pty Ltd, 75-77 Chandos St, St Leonards, NSW 2065. Tel: (02) 43 0326.

Enter T522 on Enquiry Card



The Bit Banger in operation.

## Friendly Bit Banger

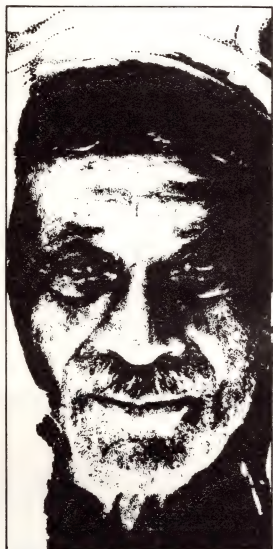
A UNIVERSALLY applicable computer peripheral product designed to relieve frustration caused by momentary upset in hardware and software user friendliness has been released in Australia by Insystems Pty Ltd. Called the Bit Banger, it can be used with any system configuration and on any computer from a Cray mainframe

to the smallest portable. The unit can be installed by the user, and comes with all necessary parts, such as instructions and hanging straps which will fit any terminal manufactured outside the USSR.

**Further information:** Insystems, 333 Moray St, Sth Melbourne 3205. Tel: (03) 690 2899.

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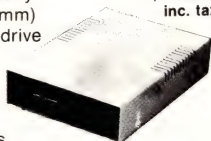
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# APPLICATIONS

## Rakon rights

RAKON Computers has secured the distribution rights for Sage micros. Two models of the Sage range are currently available: the Sage II, a single or two-user system with a range of disk options, and the Sage IV, designed to handle six users.

**Further information:** Rakon Computers Pty Ltd, 114 Alexander St, Crows Nest, NSW 2065. Tel: (02) 43 1351.

**Enter T555 on Enquiry Card**

## Sales promotion

PURCHASE Point Pty Ltd has installed a Panasonic JB 3001 with 10M-bytes of hard disk storage as an aid to sales promotions. The company had 20 promotions running last year, involving thousands of cash refunds, hundreds of thousands of competition entry forms and hundreds of trade bonuses awarded on point systems. The computer provides printouts of the number of consumer and/or trade entries for each promotion per State, per city, per store on a daily basis. The company is able to provide a completely detailed statistical breakdown of any promotion within hours of it finishing. Depending on the information the respondents are required to give, the system will provide precise figures such as number per suburb, store group, age and sex, demographics and so on.

**Further information:** Amicron Business Systems, Suite 6, 281 Pacific Highway, Nth Sydney 2060. Tel: (02) 929 3711.

**Enter T556 on Enquiry Card**

## Apple winery

THE Yalumba Winery in Angaston, South Australia, uses more than 12 Apple II computers to help in process control, data reporting and office communications. The Apples are taking some of the load from the winery's overworked IBM 34 mainframe.

**Further information:** Apple Computer Australia Pty Ltd, 37 Waterloo Rd, Nth Ryde, 2113. Tel: (02) 888 5888.

**Enter T557 on Enquiry Card**

## Clinical system

HOSPITAL Computers has released the Clinical Computers Office System, a turnkey system for doctors in private practice covering patient billing, word processing and research. It is now available on the IBM PC. A typical system with a 20M-byte

Tallgrass disk/tape unit, Nec 3550 printer, 512K-bytes memory with multi-tasking software costs about \$17,000. A licence fee covers software installation and customisation, training and continuing support and updates.

**Further information:** Hospital Computers, 86 Kareena Rd, Miranda, NSW 2228. Telephone: (02) 526 9101.

**Enter T558 on Enquiry Card**

## Repairing trucks

SYDNEY Truck Repairs, at Villawood, has had an MBC 1000 microcomputer installed for nine months. The system's duties include invoicing, ledger control and office communications. Software includes the Sanyo SSS accounting system and a specially developed package called Invoice. Spellbinder, which contains the company's customer list, is used in conjunction with Invoice.

**Further information:** Sanyo Office Machines Pty Ltd, 127 Walker St, Nth Sydney 2060. Tel: (02) 929 4644.

**Enter T559 on Enquiry Card**

## Huge Fortres

TRUSTHOUSE Forte, one of the world's largest hotel groups, has completed the UK phase of a new approach to computerising reservations called Fortres. Communications products for building the Fortres network have been supplied by Case. Although a number of its larger hotels had implemented standalone computers for accounting purposes, Trusthouse Forte was keen to find an approach to automation that would not only embrace hotels of all sizes, from 15 to 1100 rooms, but which could also provide the basis for a reservation network that would eventually encompass all of its worldwide facilities. The Fortres network comprises Case 440/12 intelligent modems, with auto-answer, auto-dialling and error correction built-in, located at the hotels to provide communications to the micros. These are linked by telephone lines to larger hotels whose locations make them suitable as network nodes. At these nodes Case DCX 816 multiplexing PADs (Packet Assembler and Disassembler units) have been installed to convert the signals into the X.25, synchronous packet-switching protocol. The data packets are then transmitted to Aylesbury by Case 9639 high-speed modems over leased lines. At Aylesbury, the Tandem mainframe thus re-

ceives its information in synchronous form, effects the necessary switching and connects the requesting device to whichever hotel has been "dialled".

**Further information:** Case Communications Systems Ltd, 1-3 Rodborough Rd, Frenchs Forest, NSW 2086. Tel: (02) 451 6655.

**Enter T560 on Enquiry Card**

## Betting pays off

MICROTOTE microcomputer-based totalisator betting systems supplied to racing authorities in Belgium last year by Control Systems Ltd, of Uxbridge, England, doubled the Pari-mutuel turnover in the first 100 days of operation. As a result, the new equipment has more than paid for itself in one year. The Microtote was first introduced in 1978. Other users include racing authorities in Britain, Australia and Barbados, the largest operator being the British Horserace Totalisator Board.

## Low-cost Medibill

MEDIBILL, a computer system which automatically handles doctors' private billing, bulk billing or a mixture of the two has been developed by Gippsland Computer Business Services. The company developed the system for Commodore Business Machines in close liaison with medical practitioners. Similar existing systems cost about \$35,000 but the basic Medibill system is \$8000. Medibill can cater to as many as 18 practitioners in a joint practice. The maximum number of patients it can handle is 65,000 and up to three terminals can be used simultaneously.

**Further information:** Commodore Business Machines Pty Ltd, 5 Orion Rd, Lane Cove, NSW 2066. Tel: (02) 427 4888.

**Enter T562 on Enquiry Card**

## Money saver

A COMPUTERISED office products ordering system developed by Glenburn Pty Ltd, of Sydney, is saving some clients thousands of dollars a year. The system is based on a software system that is tailored to the specific requirements of each client needing departmental/cost centre analysis. When a number of different departments are involved within a single organisation, each department fills out its own software form and, when these are fed into the computer, the product quantities are combined so the client gains the unit cost reduction benefits of larger volume purchases. But each department is treated as a separate entity and has access to its own costs and usage, helping to identify areas of wastage and pilfering. It also enables budgets to be planned in advance and accurate stock control to be maintained.

**Further information:** Glenburn Pty Ltd, 639 Pacific Highway, Chatswood, NSW 2067. Tel: (02) 412 1211.

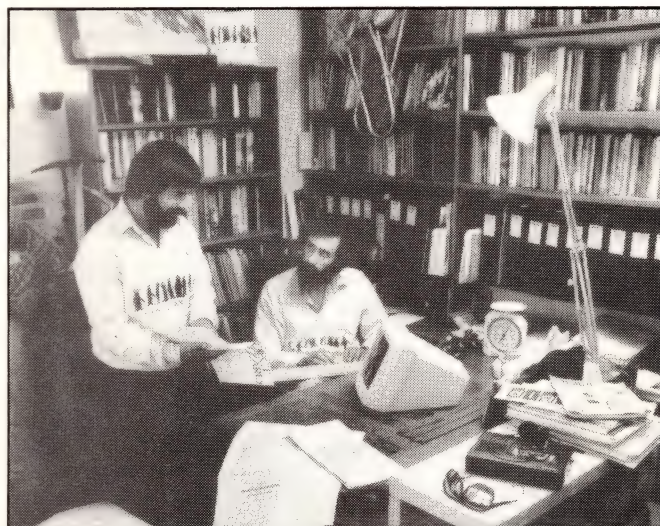
**Enter T563 on Enquiry Card**

## Project Blizzard

DIGITAL Equipment Corp has supplied a range of computer equipment, including a Rainbow 100 with 128K-bytes of memory, a printer and software, for Project Blizzard, an expedition bound for Antarctica in November. The aim of the expedition is to restore Sir Douglas Mawson's hut at Cape Denison. The computer will be used to write articles, prepare food inventories, analyse weather records and index the team's photographic library of about 10,000 photographs.

**Further information:** Digital Equipment Corp (Aust) Pty Ltd, Northern Tower, Chatswood Plaza, Railway St, Chatswood, NSW 2067. Tel: (02) 412 5252.

**Enter T564 on Enquiry Card**



Dec's Rainbow 100 forms the nerve-centre for Project Blizzard.



## Daisywheels

THE Silver Reed range of daisy-wheel printers is now available through Pacesetter Peripherals. The printers are designed as replacement units for Qume, Diablo and Brother daisywheels.

**Further information:** Pacesetter Peripherals, 16 Dickson Ave, Artarmon, NSW 2064. Telephone: (02) 439 4655.

**Enter T565 on Enquiry Card**

## Sybiz contract

SYBIZ Software Pty Ltd has signed a major US export contract for its general accounting and financial software designed for use on personal computers, including those supplied by IBM, Nec, Texas Instruments, ICL, Dec, Sirius and Canon. Under terms of the agreement, Software Research, of Los Angeles, has sole marketing rights for Sybiz throughout the US and Canada, and will establish a comprehensive distributor and dealer network for the Australian product.

**Further information:** Sybiz Software Pty Ltd, 27 Hutt St, Adelaide, 5000. Tel: (08) 223 3366.

**Enter T566 on Enquiry Card**

## Wordplex alone

WORDPLEX Australia has begun distributing Wordplex office automation systems throughout Australia. The systems were previously marketed through a distributor arrangement. Wordplex Australia now maintains offices in all State capitals, and has a staff of about 100.

**Further information:** Wordplex Australia Pty Ltd, 157 Walker St, Nth Sydney, 2060. Tel: (02) 923 2888.

**Enter T567 on Enquiry Card**

## Labtam moves

LABTAM International Pty Ltd, manufacturer of the Labtam 3000 series of computers, has established offices in Sydney and Adelaide. The addresses are: 2 Help St, Chatswood, NSW, 2067. Tel: (02) 411 2588; and 178 Gray St, Adelaide, 5004. Tel: (08) 51 4141.

**Enter T568 on Enquiry Card**

## Ripening Apple

APPLE Computer has opened a Queensland State sales office in Sth Brisbane to support the strong demand for Apple II computers in Queensland schools. Brian Madderly has been appointed senior sales rep to manage State activities. Apple has also appointed Jonathon Farrell to the new position of national

and government accounts manager. He will be based at the company's head office at Nth Ryde.

**Further information:** Apple Computer Australia Pty Ltd, 37 Waterloo Rd, Nth Ryde, NSW, 2113. Tel: (02) 888 5888.

**Enter T569 on Enquiry Card**

## Nashua centres

NASHUA Australia will establish a series of computer diskette transfer and copy service centres throughout Australia, New Zealand and the South Pacific because of an exclusive agreement with Blue Sky Industries Pty Ltd, a Sydney computer manufacturer. The service centres will use equipment supplied by Blue Sky Industries and will provide software copying and data transfer services for bonafide owners and licensees of software. A key feature of the service will be the local software support. More than 60 formats are currently available for computers using C/PM MS-DOS, PC-DOS, Unix and other common operating systems, and new formats can be readily developed. All formats and transfer programs have been developed by Blue Sky Industries and a comprehensive plan for the system is underway, including the development of all 3½in diskette formats for inclusion with existing 5¼in and 8in formats.

**Further information:** Nashua Australia Pty Ltd, 34 Chandos St, St Leonards, NSW 2065. Tel: (02) 925 3111.

**Enter T570 on Enquiry Card**

## Classic organisation

COMPUTER Classics, the computer division of Video Classics, has established an Australia-wide distribution organisation. Computer Classics, which has branch offices in all States, distributes Vic-20 and Commodore 64 machines.

**Further information:** Computer Classics, 11-15 Falcon St, Crows Nest, NSW, 2065. Tel: (02) 438 4866.

**Enter T571 on Enquiry Card**

## PortaPak support

SOFTWARE Source has agreed to support the PortaPak, the Portable Computer Co's new computer. Under terms of the agreement, Software Source has improved the PortaPak's CP/M operating system. Disk capacity has been boosted to 1.6M-bytes and screen handling speed has been increased. Software Source also agreed to supply the Spellbinder word processing and several customised utility programs includ-

ing a universal terminal emulator, print spooler and menu software.

**Further information:** Software Source Pty Ltd, 89 Oxford St, Bondi Junction, NSW, 2022. Tel: (02) 389 6388.

**Enter T572 on Enquiry Card**

## Software hotline

ARCHIVES Computers has implemented a telephone hotline system to enable immediate software fault detection and maintenance support service, regardless of the remoteness of the installation. The telephone hotline allows users to download corrupt data files to senior Archives software experts at their Sydney and Melbourne offices, have the trouble located and corrected, and then returned to users' installations via telephone. Software enhancements, updates and other information can also be transmitted to each user installation as soon as it is released. The service is provided via a normal telephone line and modems, and includes a special software program plus security devices.

**Further information:** Archives Computers Aust Pty Ltd, 163 Clarendon St, Sth Melbourne 3205. Tel: (03) 699 8377.

**Enter T573 on Enquiry Card**

## Apple appointment

APPLE Computer Australia has appointed Peter Sandys as product manager for the Apple 32 SuperMicro family, which includes the new Macintosh and Lisa personal computers. Sandys was previously national marketing manager of Microsoft Australia, responsible for marketing and sales support of a wide range of operating systems, languages, application programs and hardware products for microcomputers. He earlier gained retail experience in the computer industry as manager of City Personal Computers, Sydney.

**Further information:** Apple Computer Aust Pty Ltd, 37 Waterloo Rd, Nth Ryde 2113. Tel: (02) 888 5888.

**Enter T574 on Enquiry Card**

## Asia Pacific sales

ASIA Pacific Technology Marketing has appointed independent sales organisations in Western Australia and Victoria to handle the Molecular Supermicro range of multi-user microcomputers. Boss Computers, of Perth, will be exclusive West Australian distributor, while Computer Interface Australia, of Keilor Park, has been appointed a distributor in Victoria.

**Further information:** Asia Pacific Technology Marketing Pty Ltd, 200 Pacific Highway, Crows Nest, NSW, 2065. Tel: (02) 929 7699.

**Enter T575 on Enquiry Card**

## ADE changes

ADE Computers has recently reorganised many aspects of its operation and product base. The company has won a contract to supply more than 100 eight-terminal multi-user Universe systems. The company has opened a new factory in Prospect, NSW, and a new sales office in Parramatta, NSW. It has also enhanced specs of the ADE Universe, broadening the range to introduce smaller units which can be upgraded.

**Further information:** ADE Computers Pty Ltd, 24 Darcy St, Parramatta, NSW, 2150. Tel: (02) 689 1744.

**Enter T576 on Enquiry Card**

## Made for Japan

IBM JAPAN has announced that it will market three MicroPro software packages for the IBM Multistation 5550 micro to be distributed in Japan. The products will be WordStar, MailMerge and SpellStar.

## Marketing manager

SOFTWARE Australia has appointed Warren Shaw as marketing manager to ensure its main products are distributed Australia-wide. Several new product lines are to be distributed, including an upgraded Dual computer range manufactured in Queensland, a new Impressions range of printers, YE-Data and TEAC floppy disk drives and hard disks.

**Further information:** Software Australia, 2 Somerfield St, Mt Gravatt, Qld, 4122. Tel: (03) 349 9389.

**Enter T577 on Enquiry Card**

## Wang opens up

THE Minister for Social Security, Senator Don Grimes, officially opened Wang Computer's first Australian manufacturing plant at Bruce in the ACT on April 12. The Australian manufacturing move by Wang comes as a result of the increasing importance of Australia in Wang's worldwide network. The opening means that Australia has moved ahead of proposed Wang manufacturing plans for Mexico, Canada, France and West Germany. In the initial stages, the Canberra \$3 million plant will be the only centre in the world producing the Wang 4245 color workstation. The plant will also be producing the Wang 4230 monochrome workstation, and building and testing Australian-supplied multiwire circuit boards for the central processing units (CPUs) of the powerful and proven Wang VS range of computer systems.

**Further information:** Wang Computer, 51 Berry St, Nth Sydney 2060. Tel: (02) 436 3477.

**Enter T583 on Enquiry Card**



## TCG in Perth

TCG has opened a new office in Perth, to be managed by Tony Rycroft. TCG has been represented in Western Australia for several years by an agent.

**Further information:** The TCG Group, 30 Balfour St, Chippendale, NSW, 2008. Tel: (02) 699 8300.  
**Enter T584 on Enquiry Card**

## Vectrix conference

RICHARD Katz, 31, founder and vice-president of computer graphics engineering peripheral manufacture Vectrix Corp (US), was a guest speaker at a graphics seminar held by Australian company Microprocessor Applications in Melbourne on April 5. Microprocessor Applications, which distributes the Vectrix graphics product line in Australia, attracted more than 100 people to the conference, and introduced the new enhancements to the high-resolution, three-dimensional new Vectrix terminal which displays more than 512 simultaneous colors. Katz also announced the release of the new Vectrix Midas Color Board which elevates the IBM PC XT into a high-resolution, 512-color computer-aided-engineering system.

**Further information:** Microprocessor Applications Pty Ltd, 48 Rutland Rd, Box Hill, Vic 2765. Tel: (03) 890 0277.

**Enter T585 on Enquiry Card**

## Local Compiler

A MELBOURNE software house has sold more than 1500 copies of a locally-developed Pascal compiler (for the Commodore 64 microcomputer) since its release last October. The Pascal compiler, known as G-Pascal, was developed last year by Gambit Games, a company based in Ivanhoe, Victoria. Most sales have been within Australia, although several hundred copies have been sold to Norway and the Netherlands. G-Pascal implement a comprehensive subset of the Pascal programming language and features more than 70 extensions such as sprites, graphics, sound effects and clock. The program, available on disk and cassette, comes with an instruction manual and retails for \$79.50.

**Further information:** Gambit Games, PO Box 124, Ivanhoe, Vic 3079. Tel: (03) 479 1283.

**Enter T586 on Enquiry Card**

## Peachtree deal

JOHNSTON Brown and Associates, of Sydney, has been appointed sole distributor of the Peachtree range of micro software. The announcement coincides with the decision by the UK-based Peachtree Software International to close its regional support office in Sydney.

**Further information:** JBA Micro, 8 Help St, Chatswood, NSW, 2067. Tel: (02) 411 1144.

**Enter T587 on Enquiry Card**

## Commodore award

THE Commodore 64 has been named Home Computer of The Year in an international series of new awards. The awards were organised by British computer publication Practical Computing in conjunction with major computer magazines in the US, Italy, France, Spain and West Germany. All six publications conducted popularity polls among their readerships and the staff of Practical Computing assessed and tested every entry.

**Further information:** Commodore Business Machines Pty Ltd, 5 Orion Rd, Lane Cove, NSW 2066. Tel: (02) 427 4888.

**Enter T588 on Enquiry Card**

## New Sigma head

ROBERT Kaye has been appointed managing director of Sigma Data. Kaye will be responsible for leading a new management team recently put into place at Sigma. He will be chief operating officer of the company, responsible for all operating divisions. Kaye was previously vice-president of Data-point Corp with responsibility for all operating divisions in this region, including Australia, New Zealand and South Africa.

**Further information:** Sigma Data Corp, 157 Walker St, Nth Sydney 2060. Tel: (02) 436 3777.

**Enter T589 on Enquiry Card**

## Rogues party

IMAGINEERING held its first national dealer cocktail party at Rogues nightclub after the close of Day One of PC 84 in Sydney. It was the first time celebrities from the microcomputer industry have come together under the one roof. People such as Jerry Diamond (VisiCorp), Todd Gebhardt (MicroPro), Rodney Zaks (Sybex), Bill Gates (Microsoft) were some of the celebrities who turned out for the party.

**Further information:** Imagineering, 579 Harris St, Ultimo, NSW 2007. Tel: (02) 212 1411.

**Enter T590 on Enquiry Card**

## Sigma's 19 per cent

SIGMA Data Corp Pty Ltd and Convergent Technologies Inc, of Santa Clara, California, have agreed in principle for Convergent to acquire 19 per cent equity in the Australian company. The final agreement will be ratified by both boards of directors, but is also subject to Australian Foreign Investment Review Board approval.

**Further information:** Sigma Data Corp Pty Ltd, 157 Walker St, Nth Sydney, 2060. Tel: (02) 436 3777.

**Enter T591 on Enquiry Card**

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# EDUCATION

## Scholarship

MAGMEDIA has announced a secondary school scholarship for computer study. Initially, the company will provide a scholarship for one student at one of the computer camps organised in Sydney by Peter Carr. These camps are believed to be the first computer courses in Australia for secondary school students, and Magmedia is using the scholarship to assess the merits of the course and the scholarship. If it is successful, the company will consider more such scholarships.

**Further information:** Magmedia Pty Ltd, 28 Buffalo Rd, Gladesville, NSW 2111. Tel: (02) 816 3222. Enter T538 on Enquiry Card

## Resource centre

MCS Microcomputer Systems, of Sydney, has established a resource centre for educational computing requirements. The centre will operate nationally providing a service where teachers can evaluate educational software, books on educational computing, video tapes and hardware peripherals. A monthly newsletter is also available, free of charge, to anyone requesting it. MCS, which distributes the BBC microcomputer, has also formed an Educational Computer Users Group, which meets monthly at one of the various installations to share experiences, discuss techniques, software, class configurations and anything helpful to the user, or prospective user, of computers in education. They also keep in touch with overseas and interstate education user groups.

**Further information:** MCS Microcomputer Systems, 502 Miller St, Cammeray, NSW 2062. Tel: (02) 923 1137.

Enter T539 on Enquiry Card



The MCS resource centre for educational computing.

## Play with Language

PLAY With Language and Hands On! are two new educational software programs for first and second graders now available from Tandy Australia. These programs were designed by Children's Computer Workshop, an activity of Children's Television Workshop, creators of the Sesame Street TV series. Each software package contains diskettes, spirit masters, activity cards, gameboards, posters and a teacher's guide. Both programs require a 32K-byte TRS-80 color computer with extended color Basic and a disk drive. The programs contain a learning master which allows the teacher to tailor the software according to a child's needs. They can be used by single or multiple players, and an individual child's work can be saved on disk.

**Further information:** Tandy Australia Ltd, 91 Kurrajong Ave, Mt Druitt, NSW 2770. Telephone: (02) 675 1222.

Enter T540 on Enquiry Card

## In training

DELTAK has developed a series of video training films that explain computers in plain English. The 15-course training series is called Computers at Work: Concepts and Applications, and is designed to give all levels of staff within an organisation an insight into how computers work, how they have evolved and, most important, how they can be used to solve problems and meet a variety of business demands. The course is available on 15 one-hour tapes, supported by a simple textbook, and covers such areas as hardware and software, computer evolution, computers in business, microcomputers, the automated office, computer crime and secu-

rity, and computer careers and your future.

**Further information:** Deltak Pty Ltd, 53 Walker St, Nth Sydney, NSW 2060. Tel: (02) 436 2622.

Enter T541 on Enquiry Card

## Wholesaler concept

SOFTWARE Source has opened its first education centre in Bondi Junction, Sydney. Using a new concept, the wholesaler, rather than the dealer, supports user software training. Courses offered cover introductory business computing, Spellbinder, Lotus 1-2-3 dBase II and SuperCalc.

**Further information:** Software Source Pty Ltd, 89 Oxford St, Bondi Junction, NSW 2022. Tel: (02) 389 6388.

Enter T542 on Enquiry Card



A Northern Territory high school student works on an Apple computer.

## John Sands series

JOHN Sands Electronics has released its first series of educational software cassettes. The series of interactive learning programs, costing \$19.95 each, has been written for children from 3 to 15 years and was completed last Christmas. Pre-schooler programs include Learning to Count, Learn the Alphabet, while the Keyboard Learning Program introduces beginners to the SC3000 keyboard. Primary level programs include Addition, Subtraction and Multiplication and Division, and Spell Me Tutor, an Australian Geography Tutor and an Australian General Knowledge Tutor.

**Further information:** John Sands Electronics, 6 Bay St, Port Melbourne, Vic 3207. Telephone: (03) 645 3333.

Enter T543 on Enquiry Card

## Gordon Fair

THE Parents and Citizens Committee of Gordon Public School in Sydney will hold its computer fair on June 1-2. The fair will be staged in two parts. A guest

speaker will open the fair, which is open to children, teachers, parents and the public. An admission fee will be charged, and exhibitors will be charged \$400 per 15m of space.

**Further information:** Mrs Duval, c/o Gordon Public School. Tel: (02) 498 2385.

Enter T544 on Enquiry Card

## NT hopes

THE Northern Territory Department of Education is pinning high hopes on computerisation being able to break down cultural differences between black and white schoolchildren in the Territory. Apple personal computer equipment has been installed in all secondary schools and the department hopes to double its

school computer coverage within 18 months. It also expects its departmental computer specialists to complete 55 in-service courses for Territory teachers by the end of the first semester this year.

**Further information:** Apple Computer Australia Pty Ltd, 37 Waterloo Rd, Nth Ryde, NSW 2113. Tel: (02) 888 5888.

Enter T545 on Enquiry Card

## Online school

THE Hills Grammar School in Sydney has become one of the most computerised in Australia following the recent presentation of a \$20,000 computer to the school. The Mitsubishi computer was donated by Amicron Computer Services, the Parramatta and North Sydney-based computer consultancy and data-entry group. It will be used to develop the school's library facilities, carry out administrative tasks and teach students about computers.

**Further information:** Amicron Computer Services, 281 Pacific Highway, Nth Sydney 2060. Tel: (02) 929 3711.

Enter T546 on Enquiry Card



# COMMUNICATIONS

## Voca Datea 2000

VOCA Communications has released the Voca Datea 2000, a microprocessor-controlled telephone unit which also acts as a credit card verifier. A telephone call to the control memory banks of any data network can verify and authorise the use of bank and credit card transactions. The Voca Datea 2000 is also an ordinary telephone able to store up to 40 telephone numbers and accompanying names.

**Further information:** Voca Communications Pty Ltd, 216-222 City Rd, Sth Melbourne 3205. Tel: (03) 62 5071.

**Enter T578 on Enquiry Card**

## NetWare LAN

DATA Universe has released NetWare, the Novell Inc LAN which will support all major network hardware topologies and micro operating systems. Named systems include Corvus Systems Omninet, 3-Com's Ethernet, Nstar's Archnet, Gateway's G-Net, Novell's Netware/S and Proteon's ProNet. Operating systems sup-

ported include PC-DOS 1.1, PC-DOS 2.0, CP/M-80, CP/M-86 and the UCSD p-System.

**Further information:** Data Universe Pty Ltd, 2/190 George St, Parramatta, NSW, 2150. Tel: (02) 689 2599.

**Enter T589 on Enquiry Card**

## Chameleon actor

THE Chameleon, a protocol simulator and analyser manufactured by Tekelec Inc, of the US, acts as a front-end processor, cluster controller and network for research and development work on data communications hardware and software. The Chameleon supports such protocols as HDLC, X.25, binary synchronous communications, and IBM's SNA and SDLC. It operates at speeds up to 128K-bits/sec. Features include a detachable keyboard, 9in screen and dual 3.5in disk drives. It has 74K-bytes of RAM, 40K-bytes of PROM and uses Z80A and Intel 8085 microprocessors. RS232C V.24 interfaces are included, while RS449, V.35 and V.36 are optional. Connections for analysing DCE and DTE are standard. The display can handle ASCII, EBCDIC, Hex

and binary characters and numbers.

**Further information:** Paton Electrical Pty Ltd, 90 Victoria St, Ashfield, NSW, 2131. Tel: (02) 979 9222.

**Enter T580 on Enquiry Card**

## Integral modem

HIGH Technology Communications has released its IBM PC-compatible integral modem, the 300PC. The unit is a direct connect/answer modem designed to plug directly into the PC's and plug-compatible machines' motherboard. The modem is CCITT V.21/V.23 compatible.

**Further information:** High Technology, Communications Pty Ltd, PO Box 377, Nth Sydney, 2060. Tel: (02) 698 7897.

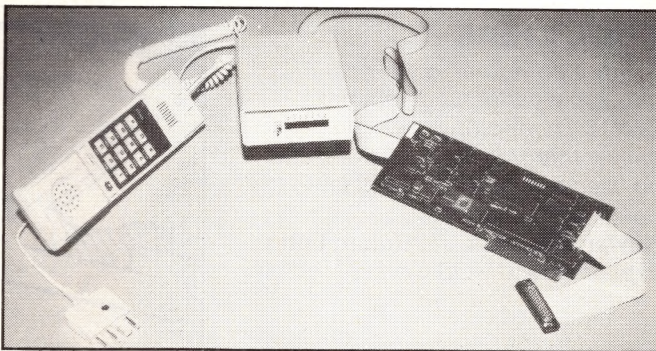
**Enter T581 on Enquiry Card**

## Modem for Apples

NETCOMM has released its Australian-designed and built multi-function modem for Apple computers. The modem, the first in a range of modem products, has auto dial, auto answer and auto disconnect facilities. The unit may be pre-set with a series of hardware switches but may then be re-configured under program control to provide any of the following facilities: 300 baud asynchronous full duplex, 1200 baud synchronous half duplex and 1200/75 baud asynchronous (Prestel).

**Further information:** Data NetComm (Australia) Pty Ltd, 8/33 Ryde Rd, Pymble, NSW 2073. Tel: (02) 498 5577.

**Enter T582 on Enquiry Card**



NetComm V.21/V.23 board-mounted modem for the Apple.

# EVENTS

## Four exhibitions

FOUR exhibitions have been organised by the Convention and Exhibition Administration for this year. An office automation show will be held on June 12-15 at the Royal Exhibition Building, Melbourne. Computers in Industry will be held on July 10-12 at the NSW Institute of Technology, Sydney. A computer education exhibition will be held at Macquarie University, Sydney, on September 3-5. SA Computer '84 will be held at Morphettville Exhibition Centre, Adelaide, on October 16-18.

**Further information:** 1984 Computer Exhibitions, PO Box 259, Roseville, NSW 2069.

**Enter T600 on Enquiry Card**

## IDC spreading

IDC will expand its program of briefing sessions this year by making five presentations in South-East Asia, New Zealand and Canberra. Hong Kong, Singapore, Auckland, Wellington and Canberra have been included in the schedule, which in the past has been confined to Sydney and

Melbourne. This is the first time the Australian office of IDC has presented outside the country. The first briefing session will be held in Melbourne on June 12, 1984, followed by Sydney on June 14, with the rest being completed by the end of July.

**Further information:** IDC Research Australia Pty Ltd, 56 Berry St, Nth Sydney 2060. Telephone: (02) 922 5300.

**Enter T601 on Enquiry Card**

## EDP seminars

VDU screen format design and ergonomics in office automation are two major topics in a series of seminars for EDP management, EDP personnel and computer users to be conducted by The Australian Computer Society in conjunction with Sydney company Computer Reporting Services. These seminars will be presented in Brisbane, Adelaide, Sydney, Canberra and Melbourne in June and July.

**Further information:** Computer Reporting Services, 284 Victoria Ave, Chatswood, NSW 2067. Tel: (02) 419 5966.

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4. Institute of Technology, Broadway. Ph: 212-3078.

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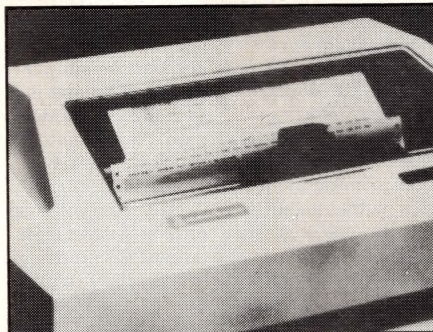
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# NEXT ISSUE

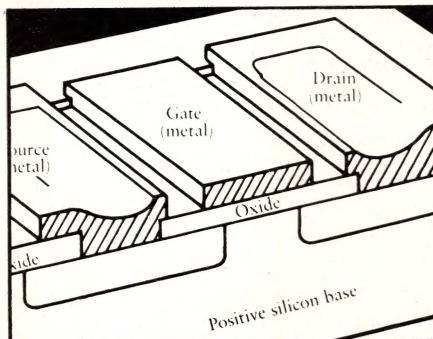
## DOT MATRIX, INK-JET and COLOR PRINTERS

Choosing a dot-matrix printer from the hundreds available can be a real problem. We survey the dot-matrix printer market from the \$300 discount special to the \$3000 multi-font speedster. **Tony Smith** investigates the state of ink-jet printing and the possibilities of color.



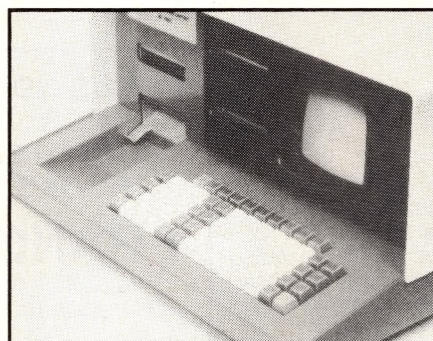
## COOL CHIPS

Fancy a computer in your car or one you wear behind your ear. CMOS Technology is starting to deliver integrated circuits that can be used for such compact, low-power applications. **Howard Dickson** and **Robert Luhn** explain how CMOS works.



## CALLING CONTROL

Microcomputers have become popular in laboratories as an alternative to expensive dedicated data recorders and experiment controllers. **Bob Dalglish** provides an introduction to the subject with examples for the University of New South Wales.



## RECENT COMPUTER EDUCATION ACTIVITIES

A constant stream of computer education books, academic papers, reports, shows and software has been produced this year. **Ian Webster** takes a look at some of the interesting packages and investigates the emergence of educational software publishing in Australia.

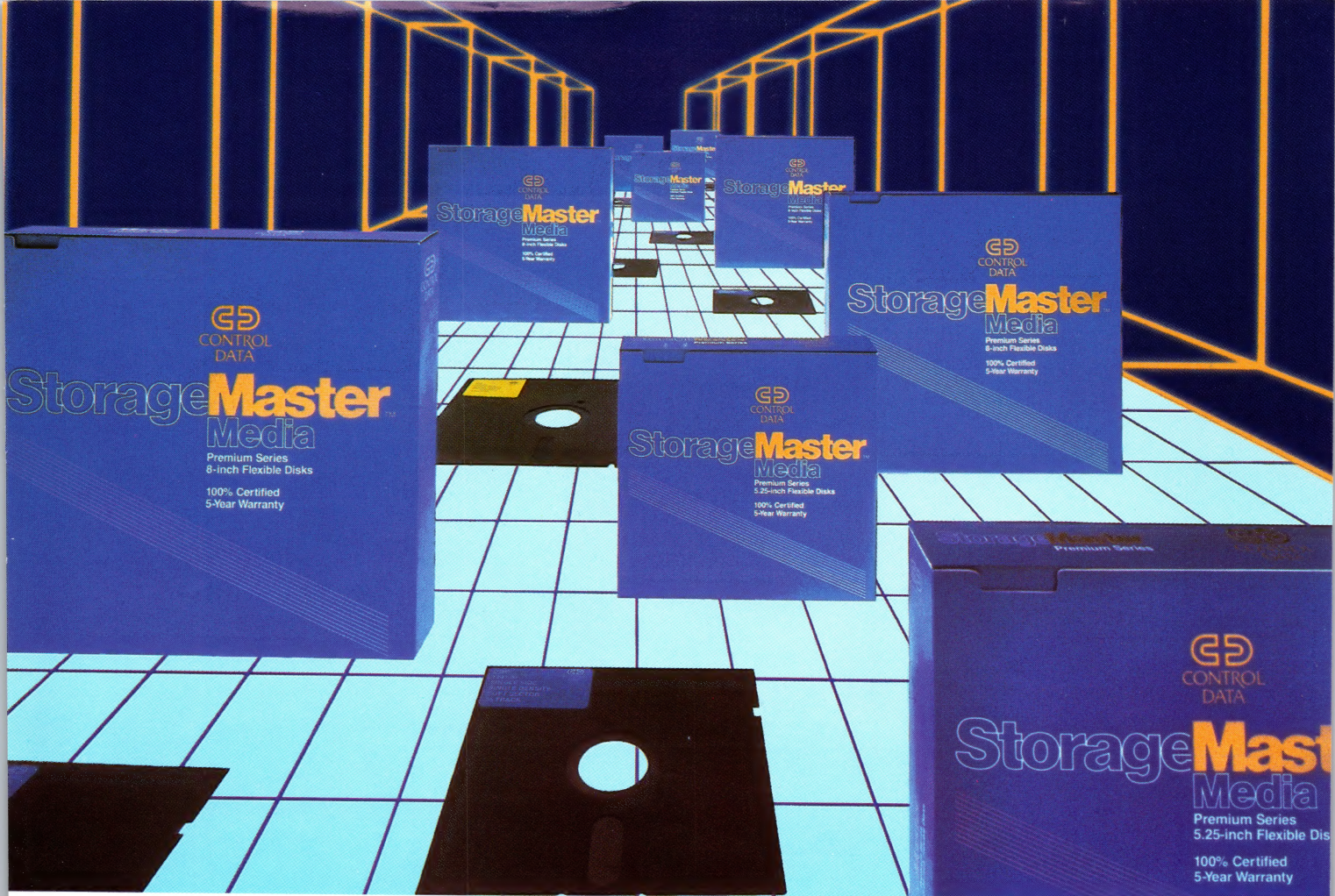


Australian Micro Computerworld is publishing its survey of the Australian microcomputer software industry in the July issue. The survey will cover software developers, distributors and systems software houses. Companies interested in participating in this survey should contact: Australian Micro Computerworld, Computerworld Pty Ltd, 37 Alexander Street, Crows Nest, N.S.W. 2065. Tel: (02) 439 5133.

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